

# Riverside Energy Park

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## Environmental Statement Technical Appendices

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APPENDIX:

# K.3

PLANNING INSPECTORATE REFERENCE NUMBER:

**EN010093**

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**OUTLINE LIGHTING STRATEGY**

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# 1 Introduction

## 1.1 Introduction

- 1.1.1 This Outline Lighting Strategy (herein ‘the Strategy’) has been prepared on behalf of Cory Environmental Holdings Limited (trading as Cory Riverside Energy (Cory)) (‘the Applicant’) by Peter Brett Associates (PBA).
- 1.1.2 The Applicant is applying to the Secretary of State under the Planning Act 2008 (PA 2008) for powers to construct and operate an integrated Energy Park, to be known as Riverside Energy Park (REP). The principal elements of REP comprise complementary energy generating development and an associated Electrical Connection (together referred to as the ‘Proposed Development’). As the generating capacity of REP will be in excess of 50 MWe, it is classified as a Nationally Significant Infrastructure Project (NSIP) under Sections 14 and 15 of the PA 2008 and therefore requires a Development Consent Order (DCO) to authorise its construction and operation.
- 1.1.3 The REP site would be located adjacent to an existing Energy Recovery Facility (ERF) operated by Cory (referred to as Riverside Resource Recovery Facility (RRRF)) situated at Norman Road in Belvedere, within the London Borough of Bexley (LBB). The underground Electrical Connection would run from the REP site and terminate at the Littlebrook substation in Dartford. A full description of REP and the Electrical Connection (which together are referred to as the Proposed Development) can be found in **Chapter 3** of the Environmental Statement (ES) (**Document Reference 6.1**), and in Schedule 1 to the draft Development Consent Order (**Document Reference 3.1**).
- 1.1.4 This Strategy is provided as part of the REP DCO application. It deals solely with external operational lighting required for REP. The Electrical Connection is not considered, as this will mainly comprise an underground cable and requires no operational lighting, no new external lighting is required at the connection point at the existing Littlebrook substation.
- 1.1.5 Matters relating to temporary construction lighting are considered separately in **Chapter 15** of the ES (**Document Reference 6.1**) and the Outline Code of Construction Practice (CoCP) (**Document Reference 7.5**).

## 1.2 The Development Consent Order Process

- 1.2.1 Cory must submit a DCO application to the Planning Inspectorate (PINS), the government body responsible for operating the planning process for NSIPs, who will first decide whether to accept the application. If accepted, PINS will appoint an Examining Authority to examine the application.
- 1.2.2 Following the examination, the Examining Authority will make a recommendation to the relevant Secretary of State. The Secretary of State must determine the application in accordance with the relevant National Policy

Statements (NPSs) for the Proposed Development, which are: NPS EN-1 (Overarching Energy Policy), NPS EN-3 (Renewable Energy Supply from Waste) and NPS EN-5 (Electricity Networks Infrastructure). If the Secretary of State decides to grant development consent then they will make a DCO which will authorise the construction, commissioning and operation of the Proposed Development.

### 1.3 REP

1.3.1 REP would be constructed on land immediately adjacent to Cory's existing RRRF, within the LBB and would complement the operation of the existing facility. It would comprise an integrated range of technologies, including: waste energy recovery, anaerobic digestion, solar panels and battery storage. The main elements of REP would be as follows:

- **Energy Recovery Facility (ERF):** to provide thermal treatment of Commercial and Industrial (C&I) residual (non-recyclable) waste with the potential for treatment of (non-recyclable) Municipal Solid Waste (MSW);
- **Anaerobic Digestion facility:** to process food and green waste. Outputs from the Anaerobic Digestion facility would be transferred off-site for use in the agricultural sector as fertiliser or as an alternative, where appropriate, used as a fuel in the ERF to generate electricity;
- **Solar Photovoltaic Installation:** to generate electricity. Installed across a wide extent of the roof of the Main REP building;
- **Battery Storage:** to store and supply additional power to the local distribution network at times of peak electrical demand. This facility would be integrated into the Main REP building; and
- **On Site Combined Heat and Power (CHP) Infrastructure:** to provide an opportunity for local district heating for nearby residential developments and businesses. REP would be CHP Enabled with necessary on site infrastructure included within the REP site.

### 1.4 Purpose of this Report

1.4.1 This Strategy provides an assessment of the potential effects from obtrusive light that could arise from artificial lighting associated with the operation of REP.

1.4.2 The key aims and objectives of this Strategy is to:

- Identify the relevant legislation, policy, guidance and standards that REP needs to consider and support;
- Determine the existing ambient lighting conditions at the REP site and immediate surrounding area;

- Establish the minimum lighting levels required to operate a safe, secure and energy efficient development;
- Identify potential light sensitive receptors which could be affected by exterior lighting required for REP; and
- Establish design objectives for the external lighting design to minimise the adverse effects of obtrusive light.

1.4.3 This Strategy incorporates general principles and recommendations to mitigate identified adverse effects of external lighting on sensitive receptors. At the time of submission of the DCO application detailed design work for REP has not been completed. Therefore, detailed information on the external lighting to be used at REP is currently unknown. Nevertheless, it is recognised that potential impacts from external lighting of REP may be a concern. Therefore, the Applicant has provided this Strategy in order to provide the principles that will be employed at REP for the final operational external artificial lighting scheme. A lighting design with modelling to show illuminance levels (as lux contour lines) will be prepared at the detailed design stage to demonstrate that the external lighting levels will be kept within the obtrusive light limitations that are appropriate for the site and immediate surrounding area.

## 2 Legislation, Planning Policy, Guidance and Standards

### 2.1 Introduction

- 2.1.1 This section presents a summary of the legislation, planning policy, standards and guidance relevant to potential for obtrusive light.
- 2.1.2 A detailed review of planning policy and guidance is contained within the Planning Statement (**Document Reference 5.2**).

### 2.2 National Legislation and Planning Policy

#### Clean Neighbourhoods and Environment Act (2005)

- 2.2.1 The Clean Neighbourhoods and Environment Act (CNEA) (2005) amended Section 79 of the Environmental Protection Act 1990 by extending the statutory nuisance regime to include light nuisance, by stating the following:

*“(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance”.*

- 2.2.2 Clause Section 102 of the CNEA (1) defines the light statutory nuisance from artificial lighting and includes guidance on suggested controls for exterior lighting dependent on context.

#### National Policy Statement

- 2.2.3 The Overarching National Policy Statement for Energy (NPS EN-1) (July 2011), published by the Department of Energy and Climate Change, provides the primary basis for decisions by the Secretary of State on NSIPs. Part 5.6 of NPS EN-1 addresses artificial light and sets out the nature/scope of assessment required by applicants (paragraphs 5.6.4-5.6.6), the basis for decision-making by the Secretary of State (paragraphs 5.6.7-5.6.10) and mitigation measures (paragraph 5.6.11).
- 2.2.4 Paragraph 5.4.16 of NPS EN-1 also addresses the statutory requirements concerning lighting to tall structures stating *“where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the IPC should satisfy itself of the necessity of such lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration”* (page 76).

#### National Planning Policy Framework

- 2.2.5 At the national level, the need to consider the potential effects of artificial lighting is embodied in the wording of the National Planning Policy Framework (NPPF) (2018) and should be considered during the application process to reduce the

potential for unnecessary delays owing to unacceptable (unknown) potential effects on local amenity and nature conservation.

2.2.6 Paragraph 180 of the NPPF states:

*“...new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation” (page 52).”*

**National Planning Practice Guidance**

2.2.7 The UK Government’s National Planning Practice Guidance (NPPG) (March 2014) for England presents specific guidance on light pollution (also referred to in this Strategy as obtrusive light) in paragraph(s) 001-006 of ID 31. **Table 2.1** below sets out how these paragraphs are relevant to the Proposed Development and how each has been considered.

Table 2.1: Review of National Planning Practice Guidance

NPPG ID 31 Paragraph	Relevance to REP
Paragraph 1: When is light pollution relevant to planning? (Reference ID: 31-001-20140306)	The potential (without appropriate design or mitigation) for external lighting from REP to be obtrusive to people and wildlife or detract from the enjoyment of the night sky, has been identified. Therefore, obtrusive light from the development has been considered further within this Strategy.
Paragraph 2: What factors should be considered when assessing whether a development proposal might have implications for light pollution? (Reference ID: 31-002-20140306)	This Strategy considers where, when and how external lighting of the Proposed Development might adversely affect the surrounding environment. This will be further considered in the development of the final lighting design.
Paragraph 3: What factors are relevant when considering where light shines? (Reference ID: 31-003-20140306)	This Strategy considers the potential for light intrusion effecting receptors outside the REP site which can lead to annoyance to people, compromise existing dark landscapes and affect natural systems.

NPPG ID 31 Paragraph	Relevance to REP
Paragraph 4: What factors are relevant when considering when light shines? (Reference ID: 31-004-20140306)	This Strategy considers the potential effects of artificial lighting during hours of darkness.
Paragraph 5: What factors are relevant when considering how much the light shines? (Reference ID: 31-005-20140306)	This Strategy considers the requirements to construct and operate REP safely and securely, and recommends lighting is limited to that required for safe operation of the site only.
Paragraph 6: What factors are relevant when considering possible ecological impact? (Reference ID: 31-007-20140306)	This Strategy specifically considers the potential effects obtrusive lighting may have on terrestrial biodiversity receptors, and provides design principles to mitigate any effects.

## 2.3 Regional Planning Policy

### Adopted London Plan

- 2.3.1 The London Plan, revised in March 2016, sets the overarching strategic plan for development in London over the next 20 to 25 years. Although the London Plan does not contain specific planning policies regarding obtrusive lighting relevant to REP, it does make reference to general guidance on external lighting requirements that this Strategy will consider.
- 2.3.2 Paragraph 7.22 sets out how *“Light of, and on, buildings should be energy efficient and appropriate for the physical context”* and Paragraph 7.61 notes that *“the indirect impacts of development (e.g. lighting) need to be considered alongside direct impacts”* on biodiversity. **Section(s) 3, 4 and 5** of this Strategy expand upon details regarding lighting requirements for REP, sensitive receptors and mitigation measures.
- 2.3.3 In addition, Policy 5.3 – Sustainable Design and Construction states that major development proposals *“should demonstrate that sustainable design standards are integral to the proposal...and ensure that they are considered at the beginning of the design process”*. The design standards discussed in Policy 5.3 make reference to minimising pollution. Although not specifically referring to minimising light pollution, this Strategy will outline measures to minimise potential impacts from external operational lighting at the REP site.

### Adopted London Environmental Strategy

- 2.3.4 The Mayor published the London Environment Strategy in May 2018. The Strategy sets out a range of actions to improve the environment, including specific policies and targets for energy and waste.

2.3.5 Chapter 5 presents the strategic policy, objectives and proposals for Green Infrastructure. Policy 5.2.1 outlines requirements to protect a core network of nature conservation sites and ensure a net gain in biodiversity and reiterates the London Plan's aim to avoid or minimise the negative impacts from light pollution on habitats and other species.

#### Draft London Plan

2.3.6 A Draft London Plan is currently being prepared, which once adopted, will supersede the existing policies within the revised London Plan (2016). The Draft New London Plan showing Minor Suggested Changes following updates to the Consultation Draft Plan, was published on 13<sup>th</sup> August 2018.

2.3.7 Paragraph 8.6.3 states that *“development proposals that are adjacent to or near SINC’s or green corridors should consider the potential impact of indirect effects to the site, such as...lighting”*.

2.3.8 **Section(s) 6 and 7** of this Strategy expand upon details of the potential impacts on sensitive receptors from external lighting and mitigation measures.

#### Sustainable Design and Construction SPD

2.3.9 The Sustainable Design and Construction Supplementary Planning Document (SPD) was adopted in April 2014 and provides guidance on the implementation of Policy 5.3 in the adopted London Plan. Chapter 4 of this SPD discusses light pollution management and includes guidance on how to design lighting appropriately to minimise nuisance.

### 2.4 Local Planning Policy

#### London Borough of Bexley Core Strategy

2.4.1 The Core Strategy, adopted by LBB in February 2012, sets out the spatial strategy for the Borough over the next 15 years to meet the challenges of a changing environment. The main policies in the Core Strategy that relate to obtrusive light are Policy CS01 – Achieving Sustainable Development and Policy CS09 – Using Bexley's Resources Sustainably.

2.4.2 Policy CS01 and CS09 outline how LBB aims to achieve *‘sustainable development’* in line with Bexley's Sustainable Community Strategy. Policy CS01 requires developers to address the sustainable development principles set out in the policy, including; *“maximising the effective and efficient use of natural and physical resources whilst addressing pollution issues to contribute to the health and wellbeing of the community and the environment”*. Although not specifically citing light pollution, this Strategy will set out design principles and mitigation measures to reduce the impacts of obtrusive light on sensitive receptors.

## Sustainable Design and Construction Guide SPD

2.4.3 The Sustainable Design and Construction Guide SPD was adopted in October 2007 and highlights the importance of design and construction in creating a more environmentally friendly and sustainable development.

2.4.4 Section 4 discusses reducing the negative impact of development on the local environment from light pollution.

## 2.5 Guidance

2.5.1 The relevant guidance documents which assist with defining acceptable standards and thresholds for exterior lighting installations include the following:

- CIBSE/Society of Light and Lighting (SLL) – Lighting Guide 1 – The Industrial Environment) Section 4.4;
- Health and Safety Executive (HSE) – HSG38 ‘Lighting at Work’;
- The Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (2011);
- Bat Conservation Trust (BCT) – Bats and Artificial Lighting in the UK (2018); and
- BCT – Landscape and Urban Design for Bats and Biodiversity (2012).

2.5.2 The ILP’s ‘Guidance Notes for the Reduction of Obtrusive Light’ provides the basis for the comparative analysis when defining whether an installation will be obtrusive to the environment and neighbouring properties. It assists in quantifying and providing acceptable maximum limitations for light intrusion, sky glow and glare from exterior lighting installations.

## ILP Environmental Zone

2.5.3 The ILP have established Environmental Zones for exterior lighting based on the existing external ambient lighting levels in the area (**Table 2.1**).

2.5.4 The ILP Environmental Zone classification determines the obtrusive light limitations for exterior lighting installations for that area. The specification of the limits for each ILP Environmental Zone are reproduced from the ILP guide (2011).

Table 2.1: Environmental Zone Classification, ILP 2011

Environmental Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

## 2.6 Standards

### British Standards

2.6.1 British Standards (BS) are criteria that are intended to set a standard of quality for goods and services. BS documents on lighting that are likely to be applicable to the operational phase of REP include the following:

- BS EN 12464-2:2014 Lighting of work places – Part 2 (9): Outdoor work places. This document provides guidance for a variety of outdoor workplaces and the anticipated lighting requirements, in the form of illuminance levels and uniformities that are used as part of standard practice.
- BS EN 5489-1:2013 Code of Practice for the Design of Road Lighting – Part 1 – Lighting of Roads and Public Amenity Areas: defines lighting classes for road lighting aimed at the visual needs of road lighting aimed at the visual needs of road users and it considers environmental aspects of road lighting.
- BS EN 13201-2:2015 Road lighting – Performance requirements: defines road lighting performance requirements, detailed as lighting classes and considers the environmental aspect of road lighting.

## 3 Existing Conditions and Sensitive Receptors

### 3.1 Introduction

- 3.1.1 This section establishes the existing ambient lighting conditions of the REP site and the surrounding area that form the 'baseline conditions'.
- 3.1.2 A desktop review of the REP site and immediate surrounding area has been undertaken to identify potential light sensitive receptors and to establish the appropriate ILP Environmental Zone classification for the REP site, as defined by the ILP's Guidance Notes for Obtrusive Light (2011).
- 3.1.3 The following sources of publicly available information were reviewed:
- Ordnance Survey mapping and aerial photography (2018);
  - Google Street View (2018); and
  - Defra Multi-Agency Geographic Information for the Countryside (MAGIC) Map Application (2018).

### 3.2 Existing Lighting Conditions

#### REP Site

- 3.2.1 The REP site includes the existing jetty extending out into the River Thames but excludes the existing Riverside Resource Recovery Facility (RRRF) main building itself. The majority of the REP site is used for private vehicle circulation areas, the jetty and access ramp, staff and visitor parking, open container storage, contractor maintenance, an electrical substation and associated landscape/habitat areas. Existing sources of artificial lighting have been identified within the REP site and these include:

#### Jetty and Access Ramp

- 3.2.2 The main sources of artificial lighting from the jetty and access bridges are flooding lighting, 400W high pressure sodium lights and 18W single 600 mm batten fluorescent luminaires (along the access bridge walkway), 400W high pressure sodium floodlights mounted on 10 m columns (along the jetty turning head and jetty berthing faces), and corrosion resistant linear fluorescent luminaires fixed at 575 mm above deck level on mounting frames and 18W single 600 mm linear fluorescent luminaires (along the jetty access walkway).

#### Surrounding Area

- 3.2.3 The REP site is bound to the north by the River Thames and the adjacent Thames Path. The northern boundary is predominately dark and unlit, apart from lighting on the jetty and access bridge as discussed above in the REP site. Norman Road and a large strategic industrial area form the majority of the

eastern edge of the REP site. The main source of artificial lighting along the eastern edges is street lighting around 10 m in height along Norman Road and within the car parks at the industrial area. To the west of the REP site is Crossness Sewage Treatment Works (STW). It is expected that artificial lighting along the western edges comprises of security lighting and street lighting along internal roads and car parks at Crossness STW. To the south of the REP site, there is Crossness Nature Reserve, a 25.5 ha Local Nature Reserve (LNR) which is part of the Erith Marshes Site of Metropolitan Importance for Nature Conservation (SMINC), containing ditches, watercourses and ponds, which are unlit.

### Riverside Resource Recovery Facility Lighting

- 3.2.4 The main source of artificial lighting within the REP site is from external lighting at RRRF (which itself is not included in the Application Boundary, but is bound by it on all sides). The external lighting is primarily SON-T lighting which has been used in preference to Metal Halide to minimise white light which can have the effect of attracting insects away from the darker areas of sites where bats can forage. The lighting at RRRF is limited to that required for the safe operation of the facility, including street lights along the existing internal road network. The building façades of RRRF are unlit.

## 3.3 Sensitive Receptors

- 3.3.1 Sensitive receptors on and surrounding the REP site are presented in **Table 3.1**.

Table 3.1: Sensitive Receptors

Receptor	Description
Human receptors with views of the site	The REP site on the banks of the River Thames is adjacent to, and close to, key long-distance trails. Publically accessible views of the REP site are afforded from the recreational feature of the Thames Path and National Cycle Network, as well as from the Public Rights of Way across Crossness Nature Reserve and along Eastern Way. Human receptors with views to the site could, without appropriate design, experience glare or increased sky glow from REP.

Receptor	Description
Ecology (Habitats and Protected Species)	<p>PBA undertook a range of ecological surveys in 2017-2018, culminating in an ecological assessment of the REP site and development proposals. The surveys and assessment determined that habitats within the REP site and surrounding area are suitable for protected or notable species, some of which are nocturnal and sensitive to changes in the level of light. See <b>Chapter 11</b> of the Environmental Statement (<b>Document Reference 6.1</b>) for further details on the ecological findings and assessment.</p> <p><b>Chapter 11</b> sets out that although no bat roosts are present within the REP site, the River Thames corridor and habitats within the Crossness LNR are likely to be used by commuting and foraging bats. The mosaic of grassland, wetland and open habitats within the REP site are less optimal for foraging bats than surrounding areas, but may also be used sporadically for foraging bats or by bats passing through the REP site. Furthermore, a number of waterbird species were also recorded using habitats within Crossness LNR and River Thames and Tidal Tributaries SINC which could be sensitive to disturbance from operational lighting.</p> <p>Light intrusion from the REP site could, without appropriate design and mitigation, affect adjacent designated areas including Crossness LNR, Belvedere Dykes SINC, River Thames and Tidal Tributaries SINC, and Erith Marshes SINC.</p>
Motorist, cyclists and pedestrians	<p>Users of Norman Road along the eastern boundary of the REP could, without appropriate design, be affected by glare from REP.</p>
Heritage Assets	<p>There are a number of listed buildings within 1 km of the REP site, including; Crossness Pumping Station (Grade I listed), workshops at Crossness Pumping Station (Grade II listed) and engine house at Crossness Sewage Treatment Work (locally listed).</p> <p>All of these listed buildings exist in an area which is already industrial in nature with numerous existing light sources. The listed buildings are not likely to experience significant impacts from the increase in lighting from the REP site. An assessment of the potential impacts of the Proposed Development on these assets is presented in <b>Chapter 11</b> of the ES.</p>

## 4 Lighting Requirements

### 4.1 Introduction

4.1.1 This section sets out the external artificial lighting requirements for REP during its operation. REP will be operational 24 hours a day, 7 days a week.

### 4.2 Operational Lighting Requirements

#### The REP site

4.2.1 New external artificial lighting will be required at the REP site so the site can be safely and securely operated during the hours of darkness. In particular, lighting will be required for safe access and wayfinding. This may include:

- Street lighting for any new internal access roads;
- Lighting over entrances and exits to and from buildings (both vehicular and pedestrian);
- Security/entrance gate lighting; and
- Wayfinding lights along internal pathways.

#### Jetty and Access Bridges

4.2.2 The REP site includes the existing jetty extending out into the River Thames. The existing jetty has sufficient capacity without modification to support the proposed throughput to REP and continued use by RRRF. Therefore, no new external artificial lighting is required for the jetty to be utilised as part of the Proposed Development.

## 5 Outline Lighting Strategy

- 5.1.1 This section sets out the design principles and overall outline strategy (including further recommendations) relevant to external artificial lighting for the REP site.
- 5.1.2 The measures set out will be reflected in the final lighting strategy which requires a written scheme for the mitigation of operational external artificial light emissions to be produced at the detailed design stage. The written scheme is secured in a Requirement of the draft DCO (**Document Reference 3.1**).

### 5.2 Design Principles

- 5.2.1 The Applicant has submitted the Design Principles (**Document Reference 7.4**) which sets out the following requirements in relation to external artificial lighting:

**DP 5.01 - Lighting will be appropriate to the local context and will mitigate lighting impacts upon identified habitats, neighbouring occupiers and the wider landscape.**

- Intelligently designed low-glare fully shielded fittings pointing downwards will be used; and
- Blue light emissions will be mitigated by using low colour temperature lighting.

**DP 5.02 - Lighting will provide illumination for the safe operation of the various activities proposed to be carried out at REP, including access and wayfinding.**

- Subject to meeting the operational and safety requirements, lighting will be designed to reduce the brightness and spread of light during operation;
- The lighting design will mitigate light spill within the Crossness Nature Reserve and be designed to maximise dark areas for wildlife;
- The lighting design will be determined by operational requirements for both day-time and night-time lighting of buildings and external areas whilst mitigating impacts on local ecology;
- The lighting design will provide adequate lighting levels to enable the safe operation of all facilities on-site and support vehicular, pedestrian and cyclist movements;
- The lighting design will be as low as guidelines allow; and
- The lighting design will deliver robust and efficient lighting which creates an attractive and safe environment for staff and visitors.

**DP 5.04 - Lighting elements will be designed to minimise spillage to Crossness Nature Reserve and the Thames Path.**

- The height and design of lighting columns will be considered to avoid light spill where possible;
- Lighting elements will be consistent in terms of materials, finish and colours and contribute to the appearance of REP;
- All luminaries will be of an energy efficient design and comply with the relevant British Standard; and
- Ease and safe maintenance will be considered as part of selection of light fittings and luminaries.

### 5.3 Further Recommendations

5.3.1 Further recommendations to be adopted alongside the Design Principles to mitigate any potential impacts from the external artificial lighting required at the REP site are as follows:

- The final lighting design will be developed to meet the appropriate ILP Environmental Zone (set out in **Table 2.1** above);
- Retained habitats such as scrub and ditch systems around the margins of the REP site would not be lit; and
- Any adjacent lighting (e.g. lighting required for safety purposes) would be directed to avoid light spill onto retained habitats around the margins of the REP site with after-dark lighting during the main period when bats are active (April to October) being minimised as far as is practicable.

## 6 Summary

- 6.1.1 National, regional and local policy sets out requirements for the consideration of obtrusive lighting, and highlights that *'the effect of such lighting on the landscape and ecology may be a relevant consideration'*.
- 6.1.2 Relevant guidance and standards, listed in **Sections 2.5** and **2.6**, are in place to ensure new developments are designed with appropriate measures to mitigate and manage the use of external artificial lighting and will be considered as part of the final lighting strategy.
- 6.1.3 **Chapter 11** of the ES (**Document Reference 6.1**) has identified that, although the habitats within the REP site are less optimal for foraging bats than surrounding areas, they may be used sporadically for foraging bats or by bats passing through the REP site. Likewise, a number of waterbird species have also been recorded in the surrounding areas. Light spill from the REP site could, without appropriate design and mitigation, affect adjacent designated areas including Crossness LNR.
- 6.1.4 External artificial lighting will form part of the overall final design for REP. This Strategy incorporates general design principles and recommendations to mitigate and manage identified adverse effects on sensitive receptors, that will be employed for the final lighting design for operational external artificial lighting for REP.
- 6.1.5 A lighting design with modelling to show illuminance levels (as lux contour lines) will be prepared at the detailed design stage to demonstrate that the lighting levels will be kept within the obtrusive light limitations that are appropriate for the site and immediate surrounding area, and are within the relevant ILP Environmental Zone limits.
- 6.1.6 The Design Principles and Outline Lighting Strategy set out in **Section 5** of this Strategy provide the overall measures for the mitigation and management of external artificial lighting required at the REP site to limit impacts on sensitive receptors as far as practicable.
- 6.1.7 The measures will effectively mitigate any potential effects on receptors identified in **Table 3.1**, including on sensitive ecological receptors present at the adjacent Crossness LNR.
- 6.1.8 Based on the Design Principles and lighting strategy secured by the draft DCO (**Document Reference 3.1**) no unacceptable effects from artificial lighting on sensitive receptors are anticipated from the Proposed Development.