Lower Thames Crossing

6.3 Environmental Statement Appendices
Appendix 7.5 - Local Landscape Character Baseline

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Appendix 7.5 Local Landscape Character Baseline

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1 Local landscape character baseline appraisal

1.1 Introduction

1.1.1 This appendix should be read alongside Chapter 7: Landscape and Visual (Application Document 6.1). The content of this appendix includes information on each Local Landscape Character Area (LLCA) relevant to the A122 Lower Thames Crossing (the Project), which has been principally informed by the following published sources of landscape character:

a. Kent Downs Area of Outstanding Natural Beauty (AONB) Landscape Character Assessment Update, Draft (Kent Downs AONB Unit, 2020) [unpublished as of 15 September 2022].

b. Gravesham Landscape Character Assessment (Gravesham Borough Council, 2009).

c. Thurrock Landscape Capacity Study (Thurrock Council, 2005).

d. Land of the Fanns Landscape Character Assessment (Land of the Fanns Landscape Partnership Scheme, 2016).

e. The Landscape Assessment of Kent (Kent County Council, 2004).

Tranquillity

1.1.2 The baseline appraisal for the LLCAs includes a description of existing tranquillity. The overarching context for tranquillity is based on Figure 7.5 (Application Document 6.2), which illustrates tranquillity mapping within the study area from the Campaign to Protect Rural England. In addition, ambient weekday noise surveys have been undertaken to inform the landscape assessment of effects on tranquillity. Further information on these noise surveys is presented in Annex A of this appendix. These surveys are supplementary to the baseline noise surveys undertaken for Chapter 12: Noise and Vibration (Application Document 6.1) and reported in Appendix 12.5: Baseline Noise Survey Information, some of which are also referred to in this appendix where relevant.

1.1.3 An average noise level value has been calculated for each noise survey location, as stated below for each LLCA, where applicable. The noise levels have been stated in terms of $L_{Aeq(T)}$, the A-weighted equivalent continuous sound level, where 'T' is the sample period of time. (The A-weighting is applied to measured sound pressure levels so that levels correspond more closely to the subjective response of the human ear, which is less sensitive at low and high noise frequencies and most sensitive in the mid-range frequencies.) The noise survey locations referred to in this appendix (A1, A2 etc from Annex A of this appendix, and LT-NML1, A-NML29 etc from Appendix 12.5 Baseline Noise Survey Information) are shown in Figure 7.6 (Application Document 6.2).

1.1.4 To provide some context to the average noise levels, reference can be made to Table 54 in Tranquillity Mapping: Developing a Robust Methodology for Planning Support (Jackson *et al*., 2008), which presents examples of typical

sound pressure levels in decibels (dB(A)) (where (A) denotes the weighting applied so levels correspond more closely to the subjective response of the human ear) with 'average rural sound at night' stated as 35dB(A). In addition, Table 57 in Tranquillity Mapping presents typical noise levels for different types of roads within the UK, with primary roads at an average speed of 60mph stated as 80dB(A) and motorways with an average speed of 70mph stated as 87dB(A). These road noise levels are given at a distance of 10m away from the road and would decrease with distance from the road.

Environmental Lighting Zones

1.1.5 Environmental Lighting Zones have been identified within the LLCAs using professional judgement and site appraisal. Annex B defines Environmental Lighting Zones E0 to E4, which are taken from the Guidance Notes for The Reduction of Obtrusive Light, Guidance Note 01/21 (Institution of Lighting Professionals, 2021). The Environmental Lighting Zones assigned to each LLCA have been based on these descriptions and are shown in Figure 7.3 (Application Document 6.2). The percentages of each Environmental Lighting Zone within the LLCAs and a description of existing lighting sources are provided in Annex B. Night-time representative viewpoint photographs are presented in Figure 7.18 (Application Document 6.2) with the locations shown in Figure 7.16 (Application Document 6.2). The following baseline appraisal for the individual LLCAs discusses the key Environmental Lighting Zones and light sources, as well as listing the relevant night-time representative viewpoints where applicable.

1.2 Kent Downs AONB

Kent Downs AONB Landscape Character Assessment Update, Draft (Kent Downs AONB Unit, 2020) [unpublished as of 15 September 2022]

1.2.1 The following information references the Kent Downs AONB Landscape Character Assessment Update, Draft (Kent Downs AONB Unit, 2020) [unpublished as of 15 September 2022], and specifically the West Kent Downs Landscape Character Area 1A. This landscape character assessment has taken precedence over the overlapping Gravesham Landscape Character Assessment (Jacobs, 2009) due to its more recent date.

1.2.2 This Landscape Character Area includes the landscape character type Chalk Downs and comprises the '*dip slope of the chalk between the Darent Valley in the west, the Medway Valley in the east, and the Kemsing Scarp and Vale to the south. The Mid Kent Downs and Kemsing Scarp are separated by both topography and extensive tracts of woodland. The West Kent Downs contains a series of deep dry valleys running roughly north-south, separated by ridges and areas of broader plateaux… Woodland is very significant in this landscape, providing an important backdrop for the rolling landform, the network of small country lanes, the scattered settlements and the extensive valley pastures*'.

1.2.3 The Kent Downs AONB Landscape Character Assessment Update, Draft specifically considers issues and sensitivities including '*localised impacts from main roads in the north-east corner of the West Kent Downs, and concerns that traffic and infrastructure (including lighting) could be increased following construction of the Project*'.

1.2.4 The landscape character assessment considers that although the topography and the presence of woodland remains fairly consistent across the West Kent Downs, there are distinct sub areas within it, three of which fall within the 2km area of search for the Project. These sub areas reflect the variations in historic land ownership, settlement patterns and road corridors and are shown in Figure 7.2 (Application Document 6.2):

a. West Kent Downs (sub area Cobham)

b. West Kent Downs (sub area Shorne)

c. West Kent Downs (sub area Luddesdown)

1.2.5 West Kent Downs Luddesdown falls within the 2km area of search but outside the Landscape and Visual Impact Assessment (LVIA) study area and as such has not been considered.

West Kent Downs (sub area Cobham) LLCA

General description and key characteristics

1.2.6 Cobham Hall Grade II* Registered Park and Garden lies on the south side of the A2, 4km west of Rochester at the east end of the village of Cobham, and has its origins as a medieval deer park. There are extensive woodlands (containing exceptionally tall ash trees), parklands designed by Humphrey Repton, several veteran trees, wood pasture and ancient woodland at Great Wood. Part of the park is now used as a golf course. Ashenbank Wood (to the west of Cobham Hall Registered Park and Garden) contains a range of archaeological sites, including a Bronze Age burial ground and World War Two (WWII) bunkers. It is an accessible area of ancient woodland popular for recreation.

1.2.7 The registered site of around 338ha comprises circa 22ha of formal gardens and pleasure grounds surrounded by a park of which circa 120ha are wooded. The site extends over both level and gently undulating ground, which rises to a low ridge in the south-east and to the isolated Windmill Hill scheduled monument, north of the house. The wooded slopes of the North Downs lie beyond the site to the south. Agricultural fencing encloses the site to the east and south from the surrounding landscape of woodland and arable farmland, with the minor Lodge Lane and the housing of Cobham village abutting the western end of the southern boundary.

1.2.8 Cobham Hall (Grade I listed building) stands below the southern slopes of Windmill Hill. The park surrounds Cobham Hall although the main surviving area of parkland lies to the west in the West Park. Cobham Hall (which is on the site of a Roman villa) is an Elizabethan manor house. A dramatic avenue of trees extends from Cobham village towards the house, although the main vehicular approach is along a sweeping driveway. Here the dominance of farmland gives way to parkland and extensive mixed woodlands with Cobham Hall. Immediately west of the hall building are loose clumps of trees of mixed ages from which the south-west lime avenue extends approximately 650m to Cobham village. North-west of the main entrance, and to the south-west either side of the avenue, the park consists of largely open grassland with a few isolated trees.

1.2.9 The landscape has a moderate level of containment as a result of gently undulating topography and coverage of hedgerow trees and woodland at Cobham Hall Registered Park and Garden and Ashenbank Wood. The LLCA includes localised vantage points, including the Roman Villa at West Park up to 118m above ordnance datum (AOD), and up to 129m AOD at Williams Hill in Cobham Hall Registered Park and Garden. Rochester and Cobham Park Golf Club offers varied terrain in a parkland setting.

1.2.10 On the northern edge of the LLCA, the A2/High Speed 1 (HS1) corridor is perceptible, flanked by woodland. Occasional glimpsed views of high-sided vehicles on the A2 are available in northerly views along the northern edge of the LLCA and traffic noise does permeate into the adjacent landscape.

1.2.11 There are numerous footpaths radiating from within Cobham Hall Registered Park and Garden. Footpath NS178 originates in Cobham, travels through Ashenbank Wood and joins the Halfpence Lane roundabout. Footpath NS177 is

located south of the A2 connecting Cobham and Henhurst Road, just south of the Gravesend East junction of the A2. Footpath NS161 originates at Knights Farm Equestrian Centre, travels through Rochester and Cobham Park Golf Club and then joins the Halfpence Lane roundabout. The North Downs Way runs north of Cuxton, looping south into the North Downs.

Landscape baseline noise surveys and conclusions on tranquillity

1.2.12 Noise sources within this LLCA include traffic along minor roads including Halfpence Lane and Thong Lane, traffic along the A2/M2 and trains along the HS1 railway line. Noise surveys have been undertaken at five locations with the following ambient noise levels monitored:

a. Ashenbank Wood (Location A7) on footpath NS182 – 50.5 to 52.6dB $L_{Aeq\ 1\ hour}$

b. Cobham Hall Registered Park and Garden (Location A8) on footpath NS179 opposite Brewers Road – 56.7 to 60.9dB $L_{Aeq\ 1\ hour}$

c. Cobham Hall Registered Park and Garden (Location A9) on footpath NS182 adjacent to Rochester and Cobham Park Golf Club – 44.5 to 53.0dB $L_{Aeq\ 1\ hour}$

d. Cobham Hall Registered Park and Garden (Location A15) on footpath NS179 adjacent to HS1 – 69.5 to 71.9dB $L_{Aeq\ 1\ hour}$

e. The Mount (Location Land 2) – 49.9 to 60.2dB $L_{Aeq\ 12\ hour}$

1.2.13 Full details of the results are presented in Annex A. These results indicate that traffic noise is greater in close proximity to the A2 highway corridor, with particularly elevated noise levels at locations A15 and A8. These locations are also influenced by passing trains along HS1, particularly location A15. At locations A7, A9 and Land 2, traffic along the A2/M2 is stated in Annex A as being a ‘distant’ noise source.

1.2.14 Noise sources on the A2/M2 and HS1 negatively influence the existing level of tranquillity in the LLCA, especially in areas close to the road and rail corridor. Visual intrusion from these linear infrastructure routes also negatively influences the level of tranquillity, although existing tree belts along the A2/ M2 and HS1 and in the central reservation of the A2 limit visual intrusion in the wider landscape. Away from the A2/M2 and HS1, the perception of noise decreases and there is a higher level of tranquillity, especially in the parts of Cobham Hall Registered Park and Garden where visual intrusion from built form and infrastructure is limited and there is an increased presence of natural woodland features. There is a sense of relative peacefulness, which promotes a rural feel and a sense of isolation that contrasts with the nearby urban areas and busy roads.

Environmental Lighting Zones

1.2.15 The West Kent Downs (sub area Cobham) LLCA lies within a wider area of dark landscape. The A2 street lighting is a noticeable night-time feature, which impacts on the darker night skies within the Kent Downs AONB. The skyglow

from the A2 and more distant light sources within Gravesend are notable. Most of this LLCA has been assessed as an E1 intrinsically dark Environmental Lighting Zone. Further information is presented in Annex B.

Assessment of landscape value

1.2.16 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, the West Kent Downs (sub area Cobham) is considered to be of high value on account of the nationally valued, accessible landscape designated as an AONB. The LLCA contains nationally important biodiversity designations and heritage assets, as well as having an area of recreational value at Ashenbank Wood.

West Kent Downs (sub area Shorne) LLCA

General description and key characteristics

1.2.17 The sub area of Shorne is influenced by the A2 road corridor to the south and is bounded to the north by the open farmland of the Hoo Peninsula. The large extent of woodland is a key distinguishing feature in combination with the ridge landform. This significant landform feature provides an attractive backdrop to views from the north. The wooded ridge (approximately 110m AOD) forms a discrete tract of landscape lying between the extensive built-up areas of Strood and Gravesend. Woodland generates a strong sense of enclosure.

1.2.18 Shorne Woods Country Park is an important recreational tourist attraction within the LLCA. The site includes an eco-friendly visitor centre and café, a sensory garden, orienteering trails, fishing lakes and picnic and play areas. It comprises woodlands, wetlands and meadows linked by waymarked trails, including the Darnley Trail that also takes in the nearby Jeskyns Community Woodland and Cobham Hall Registered Park and Garden. The medieval remains of Randall Manor, the original seat of the De Cobham family, are located in the woods.

1.2.19 National Cycle Network (NCN) route 177 runs parallel to the A2 between the A2260 near Swanscombe and Strood near Rochester, crossing the A2 at Park Pale overbridge. Other cycle routes connect with the NCN route 177 at the A2260, Pepper Hill, Wrotham Road, Valley Drive, Thong Lane and at an over-structure at the start of the M2.

1.2.20 There are areas of designated ancient woodland at Shorne and Brewers Woods and Brummelhill Wood, Shorne and Ashenbank Woods Site of Special Scientific Interest, veteran trees and Tree Preservation Orders.

1.2.21 The existing A2 and HS1 corridors are prominent along the southern edge of the LLCA. While woodland features continue to be a defining characteristic feature here, the presence of significant infrastructure is dominant.

1.2.22 The A2 corridor is flanked by mature woodland and Shorne Woods Country Park on its northern edge. The A2 is typically at a similar elevation or slightly below the ground levels within the LLCA. There is the occasional glimpsed visibility of high-sided vehicles on the A2 from the woodland on the southern edge of the LLCA and traffic noise does permeate into the landscape. Near Brewers Road Bridge and east to Park Pale, the road corridor is divided by a strong linear belt of mature trees. This belt of trees splits the A2 into two clearly distinct carriageways of four lanes. The depth of the tree belt sufficiently screens the two carriageways from each other.

Landscape baseline noise surveys and conclusions on tranquillity

1.2.23 Noise sources within this LLCA include traffic along minor roads including Brewers Road and Park Pale, traffic along the A2/ M2, trains along the HS1 railway line and aircraft. Noise surveys have been undertaken at eight locations with the following ambient noise levels monitored:

a. Thong Lodge within Shorne Woods Country Park (Location Land 1) – 50.0 to 55.9dB $L_{Aeq\ 12\ hour}$

b. Randall Heath Wood within Shorne Woods Country Park (Location Land 6) – 53.4dB $L_{Aeq\ 3\ hour}$

c. The Inn on the Lake within Shorne Woods Country Park (Location Inn on the Lake) – 70.0 to 71.8dB $L_{Aeq\ 12\ hour}$

d. Bowesden Lane (Location A10) on footpath NS321 – 49.0 to 54.9dB $L_{Aeq\ 1\ hour}$

e. Footpath NS161 (Location A12) – 57.1 to 60.6dB $L_{Aeq\ 1\ hour}$

f. Shorne Woods Country Park car park (Location A13) – 53.2 to 56.7dB $L_{Aeq\ 1hour}$

g. Permissive path north of the Inn on the Lake within Shorne Woods Country Park (Location A16) – 46.6 to 48.6dB $L_{Aeq\ 1\ hour}$

h. Brewers Wood (Location LT-NML1 reported in Appendix 12.5: Baseline Noise Survey Information) – 61.0dB $L_{Aeq\ 12\ hour}$

1.2.24 Full details of the results are presented in Annex A and Appendix 12.5: Baseline Noise Survey Information). These results indicate that traffic noise is greater in close proximity to the A2 corridor, with elevated noise levels at the Inn on the Lake and at location A12 (footpath NS161). The A2 traffic noise permeates into the wooded landscape of Shorne Woods Country Park, although at locations Land 1, Land 6, A10, A13, A16 and LT-NML1, traffic along the A2/M2 is stated in Annex A and Appendix 12.5: Baseline Noise Survey Information) as being a ‘distant’ or ‘background’ noise source.

1.2.25 Noise sources from the A2/M2 negatively influence the level of tranquillity within this LLCA, especially in areas close to the road. Visual intrusion from the A2/M2 also negatively influences the level of tranquillity, although this is only in localised areas due to the screening provided by existing tree belts along the road corridor and in the central reservation of the A2. Further away from the A2/M2, the perception of noise decreases and the level of tranquillity is higher, although some road noise is still apparent. Visual intrusion from built form and infrastructure is limited within Shorne Woods Country Park, and woodland is a prominent natural feature.

Environmental Lighting Zones

1.2.26 The West Kent Downs (sub area Shorne) LLCA falls within an area of dark rural landscape. The A2/M2 lighting is a noticeable night-time feature which impacts on the night skies within the AONB, as illustrated by night-time representative viewpoints S-04, S-05, S-13, S-14 and S-16. There is also a degree of skyglow associated with the urban area of Gravesend evident to the west. The majority of this LLCA has been assessed as an E1 intrinsically dark Environmental Lighting Zone, with the E2 low district brightness Environmental Lighting Zone along the A2/M2 corridor. Further information is presented in Annex B.

Assessment of landscape value

1.2.27 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, the West Kent Downs (sub area Shorne) is considered to be of high landscape value on account of the nationally valued, accessible landscape designated as an AONB. The LLCA also contains nationally important biodiversity designations and heritage assets, as well as an area of recreational value at Shorne Woods Country Park.

West Kent Downs LCA 1A (overview of landscape value for the sub areas of Shorne and Cobham)

Assessment of landscape value

1.2.28 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the overall value of the combination of the West Kent Downs LLCA sub areas is high due to the landscape condition, cultural associations, recreational value and perceptual aspects. The LCA is a nationally valued, accessible landscape designated as an AONB and contains nationally important biodiversity designations and heritage assets, as well as areas of recreational value at Ashenbank Wood and Shorne Woods Country Park.

Mid Kent Downs (sub area Bredhurst) LLCA

General description and key characteristics

1.2.29 The Bredhurst sub area LLCA of the Mid Kent Downs comprises a mosaic landscape of medium- to large-scale arable fields interspersed with woodland blocks, including ancient woodland at Malling Wood and Frith Wood (also known as Impton/Podkin Wood). The farmland is flat to gently rolling, falling generally north-eastwards from the edge of the steep escarpment in the adjacent Hollingbourne Scarp and Vale (sub area Boxley Vale) LLCA to the south. The large woodland blocks provide a backdrop to the farmland areas, containing views and providing a sense of enclosure. Field boundaries tend to be open, with managed hedgerows along lanes.

1.2.30 Settlement is generally limited to scattered houses and farms and the village of Blue Bell Hill, south-east of M2 junction 3. Weatherboard, red brick and clay tiles are common building materials, with some houses incorporating long clay-tiled or ‘catslide’ roofs. The M2 forms the northern boundary to the LLCA and traffic noise permeates into the surrounding landscape. However, the motorway corridor and adjacent urban edge are largely screened by tree belts, except near Yelsted Lane where high-sided vehicles and lighting columns are apparent. Communications masts and overhead lines (OHLs) are notable features in the landscape.

1.2.31 There are several Public Rights of Way (PRoWs) crossing the landscape, with links between the urban areas of Walderslade, Chatham and the adjoining countryside. The North Downs Way runs along the southern boundary of the LLCA at the top of the steep escarpment in the adjacent Hollingbourne Scarp and Vale (sub area Boxley Vale) LLCA.

Tranquillity

1.2.32 Due to the remoteness of this location from the Project route, there are no landscape-specific noise survey locations or survey locations in Appendix 12.5: Baseline Noise Survey Information within this LLCA.

1.2.33 Traffic noise from the M2 corridor is apparent in the landscape, decreasing with distance. Occasional noise is also discernible from trains along the HS1 railway line. Visual intrusion from the M2 is generally limited by mature tree belts, although OHLs and communications masts are prominent. The level of tranquillity is generally higher further south within the LLCA away from the M2 corridor and urban edge, and closer to the woodland belt and steep scarp in the adjacent Hollingbourne Scarp and Vale (sub area Boxley Vale) LLCA.

Assessment of landscape value

1.2.34 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, the Mid Kent Downs (sub area Bredhurst) LLCA is considered to be of high landscape value on account of the nationally valued landscape designated as an AONB. The LLCA also contains nationally important ancient woodland and a footpath network of recreational value.

Hollingbourne Scarp and Vale (sub area Boxley Vale) LLCA

General description and key characteristics

1.2.35 The Boxley Vale sub area LLCA of Hollingbourne Scarp and Vale is strongly influenced by the steep, wooded escarpment along its northern edge. At the base of the escarpment is a patchwork of small- to medium-sized pasture and arable fields, vineyards, linear tree belts and small woodland blocks. Some fields and minor roads are bounded by hedgerows, although many field boundaries are open or delineated by fences and ditches. The wooded escarpment contains the Wouldham to Detling Escarpment SSSI and large areas of ancient woodland, including Frith Wood and Westfield Wood. The woodland also forms a backdrop to the farmland further south, with its high evergreen content being particularly prominent in winter. The underlying chalk is also apparent in grassland areas along the escarpment, such as at Boxley Warren Nature Reserve. There are long-distance views from the top of the escarpment over the wider countryside below through gaps in vegetation.

1.2.36 Isolated farms and houses are linked by minor lanes; otherwise, settlement is limited. Buildings are often constructed in weatherboard or brick, or are timber-framed, such as the Grade II listed Boarley Cottage. The North Downs Way and Pilgrim's Way are historic east-west routes along the top and bottom of the escarpment respectively, now designated as long-distance routes. Several other PRoWs cross the landscape, some of which link with the long-distance routes. The White Horse Stone is a prehistoric standing stone located along the Pilgrim's Way, which is designated as a scheduled monument. The HS1 railway line, A229 road corridor and OHLs contrast with the surrounding rural landscape.

Tranquillity

1.2.37 Due to the remoteness of this location from the Project route, there are no landscape-specific noise survey locations or survey locations in Appendix 12.5: Baseline Noise Survey Information within this LLCA.

1.2.38 Traffic noise from the A229 and M20 is apparent in the landscape, as well as occasional trains along the HS1 railway line. OHLs also introduce visual intrusion. The level of tranquillity is generally higher further north within the LLCA away from transport routes, close to and within the woodland escarpment.

Assessment of landscape value

1.2.39 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, the Hollingbourne Scarp and Vale (sub area Boxley Vale) LLCA is considered to be of high landscape value on account of the nationally valued landscape designated as an AONB. The LLCA also contains nationally important biodiversity and heritage designations, and a footpath network of recreational value.

Medway Valley (sub area The Eastern Scarp) LLCA

General description and key characteristics

1.2.40 The Eastern Scarp sub area LLCA of Medway Valley is defined by a pattern of intensively farmed 'scarp-foot' fields set below a densely wooded escarpment. Hedgerow field boundaries have generally been lost or are in poor condition. Conversely, the woodland at the top of the escarpment is a prominent feature that forms a backdrop to views from the south, as well as containing the influence of buildings within the River Medway valley outside of the AONB. Woodland areas contain beech and yew, and calcareous grassland is present intermittently across the escarpment. The underlying chalk is also apparent along the escarpment, such as at the disused chalk quarries north-east of Burham. Burham Down Nature Reserve, areas of ancient woodland and Wouldham Common form part of the wooded escarpment.

1.2.41 Settlement is generally limited to a few scattered farms and houses along local roads, the edge of Burham village, and the settlement of Kit's Coty south of Blue Bell Hill and M2 junction 3. Kit's Coty is a small rural community, contained within a regular grid of fields and woodland blocks. The Neolithic scheduled monument Kit's Coty House Burial Chamber is located south of Kit's Coty.

1.2.42 The North Downs Way runs along the top of the wooded escarpment and at Blue Bell Hill Picnic Site there is a panoramic view with distant views to the south-west. The Pilgrim's Way also passes through the area, from which a series of ancient drovers' roads run up the escarpment slopes.

1.2.43 Lines of pylons and industrial buildings are visible in views across to the lower River Medway valley. The River Medway forms an important and distinctive feature in views.

Tranquillity

1.2.44 Due to the remoteness of this location from the Project route, there are no landscape-specific noise survey locations or survey locations in Appendix 12.5: Baseline Noise Survey Information within this LLCA.

1.2.45 Traffic noise from the M2, A229 and Rochester Road through Burham is apparent in the landscape. OHLs and industrial buildings in the lower River Medway valley introduce visual intrusion, although these are not readily apparent within the study area. The level of tranquillity is generally higher within the central part of the LLCA away from transport routes, close to and within the wooded scarp.

Assessment of landscape value

1.2.46 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, the Medway Valley (sub area The Eastern Scarp) LLCA is considered to be of high landscape value on account of the nationally valued landscape designated as an AONB. The LLCA also contains nationally important biodiversity and heritage designations, and a footpath network of recreational value.

1.3 The setting of the Kent Downs AONB and Green Belt

Gravesham Landscape Character Assessment (Gravesham Borough Council, 2009)

1.3.1 The descriptions of the following LLCAs have been based on the published Gravesham Landscape Character Assessment, but have been refined through detailed study and analysis undertaken for this LVIA.

1.3.2 Within the setting of the Kent Downs AONB, the LLCAs have been refined as follows:

a. Subdivision of the Higham Arable Farmlands LLCA into three distinct sub areas of Chalk, Thong and Gadshill.

b. The remaining part of the Shorne Woodlands LLCA outside the AONB has been renamed as Shorne Wooded Slopes.

Higham Arable Farmland (sub area Gadshill)

General description and key characteristics

1.3.3 Higham Arable Farmland (sub area Gadshill) is in the Green Belt between the settlements of Higham to the north and Strood to the south. The focus of this area is the chalk downland dry valley associated with the A289 corridor near Gadshill. This area has a distinct urban fringe character because of the presence of settlements on higher ground to the north and south. The M2 junction 1 sits at the western edge of this area.

1.3.4 The landscape predominantly comprises arable farmland falling gently northwards from the edge of Strood towards the A289, and sloping north and south from the ridgeline along Hermitage Road east of Higham. Fields are of varying sizes and bounded by ditches and hedgerows. Dense tree belts line the A289 corridor and junctions. This landscape also has a strong visual association with the wooded slopes of Great Crabbles Wood to the north and the wooded skyline of Cobham Hall Registered Park and Garden on higher ground beyond the M2 junction 1 within the AONB to the south-west.

Tranquillity

1.3.5 Due to the relative remoteness of this location from the Project, no landscape-specific noise survey locations are present within this LLCA. There are also no survey locations in Appendix 12.5: Baseline Noise Survey Information associated with this LLCA.

1.3.6 Noise and visual intrusion from the A2 and A289 are largely not perceptible from within the LLCA due to the intervening vegetation and topography, except from localised areas in close proximity to the road corridors. Visual intrusion and noise from the A2 and A289 in these localised areas, and from rural residential properties and minor roads elsewhere, negatively influence the level of tranquillity. However, vegetation belts along roads and settlement edges limit visual intrusion. In addition, woodland on the surrounding slopes and in the Kent Downs AONB results in a strong perception of natural features (woodland), which positively influences the level of tranquillity.

Environmental Lighting Zones

1.3.7 The Higham Arable Farmland (sub area Gadshill) LLCA includes light sources along the M2 corridor and in the adjoining urban area of Strood and Higham. Some of these light sources are set against the backdrop of the North Downs AONB, which is a dark landscape. The majority of this LLCA has been assessed as an E2 low district brightness Environmental Lighting Zone, with a small area of E3 medium district brightness. Further information is presented in Annex B.

Assessment of landscape value

1.3.8 The LLCA is a locally valued landscape, which provides part of the wider north-eastern setting to the Kent Downs AONB, and contains PRoWs of recreational value.

1.3.9 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual

Assessment Methodology, the value of the LLCA is considered to be medium by virtue of its condition, recreational value and perceptual aspects.

Shorne Wooded Slopes

General description and key characteristics

1.3.10 The Shorne Wooded Slopes LLCA lies within the Green Belt, encompassing the rural settlement of Shorne to the west and extending to the Higham urban area to the east. This is an intimate, elevated landscape, which is shielded from the M2 junction 1 and the A289 at the southern edge by a false cutting and dense woodland in the adjacent West Kent Downs (sub area Shorne) LLCA. The false cutting acts as a visual and noise buffer for the lower-lying ground near Bowesden Lane.

1.3.11 The main focus of the area is the elevated wooded ridgeline delineated by Pear Tree Lane and the associated rural ribbon development along it. The land on either side of the ridgeline falls steadily away to the north and south and is heavily wooded, including ancient woodland at Great Crabbles Wood, Starmore Wood and Peartree Wood. A mixture of pasture and arable fields of varying sizes lies within the woodland areas. The village of Shorne is present within the LLCA, although it is largely enclosed by trees, which reduces its influence on the surrounding fields and woodland.

1.3.12 Views out of the LLCA are limited by woodland, which provides a strong sense of enclosure.

Tranquillity

1.3.13 Due to the relative remoteness of this location from the Project, no landscape-specific noise survey locations are present within this LLCA. There are also no survey locations in Appendix 12.5: Baseline Noise Survey Information associated with this LLCA.

1.3.14 Noise from the A2, M2 and A289 are not largely perceptible from within this LLCA. The densely wooded nature of the LLCA limits visual intrusion and results in a strong perception of natural woodland, which positively influences the level of tranquillity.

Environmental Lighting Zones

1.3.15 The primary local light sources are from the highway lighting columns along the M2 and A2, which extend into outer suburban and residential areas in proximity to the road network, and lighting within Shorne village. Part of the LLCA falls within an area of dark landscape abutting the West Kent Downs LCA 1A, which has been assessed as an E1 intrinsically dark Environmental Lighting Zone. The rest of the LLCA has been assessed as an E2 low district brightness Environmental Lighting Zone. This is apart from Shorne village, which has been assessed as an E3 medium district brightness Environmental Lighting Zone. Further information is presented in Annex B.

Assessment of landscape value

1.3.16 The Shorne Wooded Slopes LLCA is a locally valued landscape, which provides the immediate setting to the Kent Downs AONB and contains ancient woodland that contributes to landscape value.

1.3.17 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual

Assessment Methodology, it is concluded the value of the LLCA is high by virtue of its condition, habitat diversity and perceptual aspects.

Higham Arable Farmland (sub area Thong)

General description and key characteristics

1.3.18 Higham Arable Farmland (sub area Thong) incorporates the A2 and HS1 infrastructure corridor along its southern edge and the associated tree belts, including part of Ashenbank Wood north of the railway line. Singlewell substation and a service area and filling station are located between the A2 and HS1 within the LLCA.

1.3.19 The LLCA is within Green Belt encompassing the village of Thong to the east and extending to the urban area of Gravesend to the west, with the flat to gently undulating landform rising to the east and south-east. The focus of this area is the rural settlement of Thong, a designated conservation area with associated listed buildings. The settlement has a strong relationship with the open arable landscape to its west, which separates Thong from Gravesend. When viewed from the urban edge, the settlement of Thong is set against the more elevated wooded backdrop of the AONB. The landscape has a strong association with the wooded skyline of Shorne Woods within the AONB.

1.3.20 There are views across the open arable land to the south over the A2/HS1 corridor, with the tower of St Mary Magdalene Church, Cobham being a notable local landmark in these views. Claylane Wood, located at the south-west corner of this LLCA, is ancient woodland.

1.3.21 An OHL traverses the landscape to the west of Thong and the A2 forms a prominent daytime and night-time feature along the southern edge. Several footpaths and roads used as pedestrian routes cross the arable farmland, including the NCN route 117 that runs along the northern edge of the A2.

1.3.22 The relatively flat area of open arable fields west of Thong was once part of Gravesend Airfield, a former fighter command airfield during WWII.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.23 Noise sources within this LLCA include traffic along the A2 to the south. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. LT-NML2 (White Horse Cottages) – 56.9dB $L_{Aeq\ 12\ hour}$

b. LT-NML3 (Genesta Glade) – 50.7dB $L_{Aeq\ 12\ hour}$

c. ST-NML1 (Marling Manor) – 64.3dB $L_{Aeq\ 12\ hour}$

1.3.24 The results indicate that traffic noise is greater closer to the A2 corridor, as reflected in the higher noise levels recorded at ST-NML1 at the south-eastern fringe of Gravesend. At location LT-NML2, traffic along the A2 is stated in Appendix 12.5 Baseline Noise Survey Information as being a ‘distant background’ noise source.

1.3.25 The overall level of tranquillity in the LLCA is negatively influenced by noise and visual intrusion from the A2 corridor, Thong Lane, built form in Gravesend and OHLs. The filtered visibility of infrastructure on the A2 corridor is especially

apparent to the south of the LLCA. Where the rural feel of the landscape is greater and where the surrounding wooded slopes within the Kent Downs AONB are more prominent, the level of tranquillity is greater. However, noise from the A2 influences throughout.

Environmental Lighting Zones

1.3.26 The Higham Arable Farmland (sub area Thong) includes light sources in the night-time environment along the A2 corridor, some of which are set against the dark backdrop of the North Downs AONB as illustrated by night-time representative viewpoints S-25 and S-28. The floodlit tower of St Mary Magdalene Church, Cobham is a notable night-time feature evident to the south. The majority of this LLCA has been assessed as an E2 low district brightness Environmental Lighting Zone. Further information is presented in Annex B.

Assessment of landscape value

1.3.27 The LLCA is a locally valued landscape which provides the immediate setting to the Kent Downs AONB, containing nationally important biodiversity designation, heritage assets and PRoWs of recreational value.

1.3.28 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is high, by virtue of its condition, habitat diversity, cultural associations, recreational value and perceptual aspects.

Istead Arable Farmlands

General description and key characteristics

1.3.29 Istead Arable Farmlands is in the Green Belt to the south of Gravesend and HS1. The landscape is gently undulating, allowing wide and open views out towards the urban edge of Gravesend and HS1 to the north. This is a transitional, open, arable landscape, divided by tracks and minor roads. Medium- to large-scale fields form a regular pattern with boundaries running generally from north to south and east to west. Settlement is generally scattered, apart from the village of Istead Rise adjoining Wrotham Road.

1.3.30 Small copses of native woodland appear sporadically across the landscape, reducing the openness of the arable farmland locally. To the south-east, fruit orchards with pollarded hedgerow boundaries are the dominant land use. There is a stronger sense of enclosure among these orchards. The recreational area of Jeskyns Community Woodland lies to the north-east with a network of PRoWs and informal footpaths.

1.3.31 This landscape has a strong association with the wooded skyline of Shorne Woods and Ashenbank Wood within the AONB to the east.

1.3.32 OHLs are prominent in the landscape, as well as extensive polytunnels to the north-east of Southfleet.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.33 Noise sources within this LLCA include traffic along the A2, trains along the HS1 railway line and aircraft. Noise surveys have been undertaken at two locations with the following ambient noise levels monitored:

a. Footpath NS177 within Jeskyns Community Woodland (Location A11) – 47.9 to 53.4dB $L_{Aeq\ 1\ hour}$

b. The car park within Jeskyns Community Woodland (Location A14) – 53.9 to 55.9dB $L_{Aeq\ 1\ hour}$

1.3.34 Full details of the results are presented in Annex A. These results indicate that traffic noise from the A2 is apparent within this LLCA. However, at locations A11 and A14 traffic is stated in Annex A as being ‘distant’ or ‘background’ noise.

1.3.35 Noise and visual intrusion from the A2 and HS1 corridors are apparent but negative influences on the level of tranquillity are limited to a localised area along the northern boundary of the LLCA due to intervening topography and vegetation. Visual intrusion from isolated buildings, minor roads, OHLs and the upper sections of gantries and street lighting along the A2 negatively influence the level of tranquillity. Conversely, where the surrounding wooded slopes within the Kent Downs AONB and vegetation within Jeskyns Community Woodland are more prominent, the level of tranquillity is greater.

Environmental Lighting Zones

1.3.36 The Istead Arable Farmlands LLCA includes notable light sources in the night-time environment along the A2 corridor to the north-east, and there is skyglow associated with Gravesend to the north, as illustrated by night-time representative viewpoint S-20. The majority of this LLCA has been assessed as

an E2 low district brightness Environmental Lighting Zone, with a pocket of E3 medium district brightness at Istead Rise. Further information is presented in Annex B.

Assessment of landscape value

1.3.37 The LLCA is a locally valued accessible landscape, which forms part of the immediate setting of the Kent Downs AONB to the west, containing Jeskyns Community Woodland and PRoWs of recreational value.

1.3.38 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, recreational value and perceptual aspects.

Gravesend Southern Fringe

General description and key characteristics

1.3.39 The Gravesend Southern Fringe LLCA is a linear urban fringe landscape that runs along the southern edge of Gravesend. The majority of the LLCA is sandwiched between the urban edge and the HS1 corridor.

1.3.40 This landscape is dominated by the A2 corridor, which is bordered by linear lengths of open space that largely comprise areas of rough grassland and tree belts along the A2 and HS1. Part of the open space between the A2 and the urban edge has been remodelled to create a linear recreational landscape incorporating a footway and cycleway running its entire length and the Cyclopark, which contains BMX tracks and a skatepark. Recreational routes also cross the A2 corridor, linking the town to the countryside.

1.3.41 Within the LLCA, there are internal views running east and west, as well as extensive views over the A2/HS1 corridor towards the countryside in the south and occasional views across Gravesend towards the River Thames to the north.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.42 Noise sources within this LLCA include traffic along the A2, trains along the HS1 railway line to the south and local traffic noise within the residential urban edge of Gravesend to the north. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, two locations have been surveyed and are reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML29 (Watling Street) – 62.0dB $L_{Aeq\ 3\ hour}$

b. A-NML30 (Watling Street) – 67.7dB $L_{Aeq\ 3\ hour}$

1.3.43 The results indicate that traffic noise from the A2 corridor is dominant. Noise and visual intrusion from the A2, HS1 and urban edge of Gravesend negatively influence the level of tranquillity within the LLCA. Existing vegetation belts along the A2 and HS1 limit visual intrusion locally.

Environmental Lighting Zones

1.3.44 The Gravesend Southern Fringe LLCA contains both E2 low district brightness and E3 medium district brightness Environmental Lighting Zones, with prominent light sources in the night-time environment along the A2 corridor, particularly at the A2/Wrotham Road and Gravesend East junctions. Further information is presented in Annex B.

Assessment of landscape value

1.3.45 The LLCA is a locally valued landscape, which provides a buffer to the A2 corridor and is used for recreation. The LLCA has a perceptual association with the wider open landscape to the south of the A2/HS1 infrastructure corridor.

1.3.46 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, recreational value and perceptual aspects.

Higham Arable Farmland (sub area Chalk)

General description and key characteristics

1.3.47 Higham Arable Farmland (sub area Chalk) is in the Green Belt immediately east of Gravesend and south of Shorne and Higham Marshes. The landscape gently undulates and generally rises from north to south towards the upper wooded slopes of the Kent Downs AONB in the adjoining West Kent Downs (sub area Shorne) LLCA. There are extensive views across the open, medium- to large-scale arable fields towards the reclaimed marshes and River Thames in the north. Tree cover is largely limited to settlement edges, the A226 corridor and Southern Valley Golf Course.

1.3.48 The Southern Valley Golf Course and sports fields at Cascades Leisure Centre encompass a large area on the edge of Gravesend. Numerous footpaths cross the landscape between Shorne and Gravesend. Away from the busy A226 corridor, which passes through the centre of the LLCA, there are few roads influencing the landscape. However, OHLs are prominent running south-west to north-east across the relatively open farmland.

1.3.49 The tower of the Grade II* listed St Marys Church to the east of the village of Chalk forms a local landmark. The Thames View Crematorium and Cemetery is also a notable feature adjacent to the church along the A226.

1.3.50 This landscape has a strong association with the adjoining Shorne and Higham Marshes LLCA and Essex landscape beyond to the north, and with the wooded skyline of Shorne Woods within the AONB to the south.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.51 Noise sources include local traffic on the A226 and within Chalk and Gravesend. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. LT-NML4 (Church Lane) – 54.1dB $L_{Aeq\ 12\ hour}$

b. A-NML4 (Gravesend Road) – 62.0dB $L_{Aeq\ 3\ hour}$

c. A-NML5 (Polperro) – 59.9dB $L_{Aeq\ 3\ hour}$

1.3.52 The results indicate that traffic noise is apparent along the A226, with a greater noise level when closer to the road. The overall level of tranquillity in the LLCA is negatively influenced by some noise and visual intrusion associated with the A226 corridor and built form along the urban edges of Chalk and Gravesend, although the influence of these features is localised. Away from these features, where the rural feel of the landscape is greater and the surrounding wooded slopes within the Kent Downs AONB are more prominent, the level of tranquillity is greater.

Environmental Lighting Zones

1.3.53 The Higham Arable Farmland (sub area Chalk) LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone. However, light sources are visible in Gravesend to the west and along the River Thames and at Tilbury

Docks to the north, as illustrated by night-time representative viewpoints S-31, S-32 and S-33. Further information is presented in Annex B.

Assessment of landscape value

1.3.54 The LLCA is a locally valued landscape, which provides the immediate setting to the Kent Downs AONB. It contains a nationally important biodiversity designation, heritage assets and PRoWs of recreational value. However, it is influenced by detracting features, such as the urban edge of Gravesend and industry along the River Thames.

1.3.55 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is high, by virtue of its condition, cultural associations, recreational value and perceptual aspects.

Shorne and Higham Marshes

General description and key characteristics

1.3.56 The Shorne and Higham Marshes LLCA lies to the east of Gravesend, directly south of the River Thames and within the Green Belt in Gravesham. The LLCA stretches to the eastern boundary of Gravesham Borough and to the fringe of the agricultural land to the south. Away from the housing area in Chalk and the Milton Rifle Range, there are no roads; access is in the form of PRoWs and farm tracks. The Thames and Medway Canal (disused) and railway line between Gravesend and Higham create strong linear elements crossing the LLCA from west to east.

1.3.57 Much of the reclaimed estuarine marshland area, divided by ditches and meandering waterways, is a nationally designated Site of Special Scientific Interest and internationally designated Ramsar site. Some of the undesignated marshland area is presently used by the Milton Rifle Range and is cordoned off from the PRoW by tall, intrusive fencing, with other areas used as pasture. The Saxon Shore Way runs along the sea defence by the River Thames and NCN route 1 follows the canal towpath. This landscape has a strong association with the Higham Arable Farmlands (sub area Chalk) and the wooded skyline of Shorne Woods within the AONB to the south.

1.3.58 The absence of vegetation, combined with the flat landscape, results in open, wide views, including to the north bank of the River Thames. Overall, the marshes are considered to be very distinct and possess a strong sense of place and remoteness away from the urban edge.

1.3.59 Cultural association contributes to landscape value as the Thames Marshes provide the geographical context of Charles Dickens' *Great Expectations*; Dickens describes the Thames Marshes as a '*dark flat wilderness*... *intersected with dikes and mounds and gates, with scattered cattle feeding on it*' (Discover Gravesham, n.d.).

Landscape baseline noise surveys and conclusions on tranquillity

1.3.60 Noise sources within this LLCA include distant and occasional river traffic, aircraft and trains. A noise survey has been undertaken at one location with the following ambient noise levels monitored:

a. Footpath NS138 adjacent to Shornemead Fort on the banks of the River Thames (Location Land 4) – 41.6dB $L_{Aeq\ 3\ hour}$

1.3.61 Full details of the results are presented in Annex A. The survey indicates that there are low levels of noise within the undeveloped parts of this largely remote LLCA. Noise sources are limited which has a positive influence on the level of tranquillity. While there is a degree of visual intrusion from built form and infrastructure at Tilbury Docks and the urban edge of Gravesend, as well as from passing ships along the River Thames, the perception of this is limited in the remote areas of reclaimed marshland. Furthermore, the perception of the natural wooded slopes of the Kent Downs AONB and the adjacent rolling farmland to the south has a positive influence on tranquillity.

Environmental Lighting Zones

1.3.62 The Shorne and Higham Marshes LLCA falls within the E2 low district brightness Environmental Lighting Zone. However, light sources (outside the LLCA) in Gravesend are visible to the west and distant light sources are visible to the north of the River Thames, including the prominent London Gateway Port and Tilbury Docks, as illustrated by night-time representative viewpoint S-38a. Further information is presented in Annex B.

Assessment of landscape value

1.3.63 The LLCA is a locally valued landscape associated with the Thames Estuary and provides part of the wider setting to the Kent Downs AONB. It contains internationally and nationally important biodiversity designations, some heritage assets and PRoWs of recreational value. This landscape has a cultural association with Charles Dickens.

1.3.64 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is high, by virtue of its condition, habitat diversity, cultural associations, recreational value and perceptual aspects.

Thurrock Landscape Capacity Study (Thurrock Council, 2005)

1.3.65 The Thurrock Landscape Capacity Study was a technical study undertaken to identify the landscape capacity to accommodate potential development scenarios. The study identifies Landscape Character Areas and tests their sensitivity to a generalised increase in development, and then specifically tests the capacity of the landscape to accommodate various development options around key settlements within the borough, including urban extensions and development on the urban fringe. The descriptions of the following LLCAs have been based on the published landscape capacity study, but have been refined through detailed study and analysis undertaken for this LVIA. Forthcoming updates to the published Thurrock Landscape Capacity Assessment in 2022 have not been considered at this stage as this information was not publicly available in sufficient time for DCO submission [unpublished as of 29 September 2022].

1.3.66 Thurrock Council's Landscape Capacity Study is partially overlapped by the more recent Land of the Fanns Landscape Character Assessment (Land of the Fanns Landscape Partnership, 2016). For the purposes of the LVIA, the A13 and the urban area of Grays have been taken as the transition between the two landscape character assessments used to inform the assessment. The LLCAs shown in Figure 7.2 (Application Document 6.2) are based on the Thurrock Landscape Capacity Study character areas south of the A13/east and north-east of Grays and the Land of the Fanns Landscape Character Assessment character areas to the north of the A13/west of Grays.

Mucking Marshes

General description and key characteristics

1.3.67 The LLCA is in the east of Thurrock and forms part of an extensive area of estuarine marsh that extends from Holehaven Creek in the east to Tilbury Docks near Grays. This area is in the Green Belt adjoining the north bank of the River Thames.

1.3.68 The landscape is level, low-lying, exposed and windswept, consisting predominantly of grazing marsh, although some areas have been used as landfill. Small waterbodies and lakes are also present in the marshes.

1.3.69 Settlement is limited to the western edge of the LLCA and comprises the village of East Tilbury, which provided the housing for the adjacent Bata factory, and other development along Princess Margaret Road. The historic Coalhouse Battery and Coalhouse Fort are both located at the southern end of the LLCA. The latter forms an important historic Thames-side landmark feature and is a visitor attraction.

1.3.70 Long-distance, open, wide views are available inland towards Buckingham Hill and Langdon Hill, as well as across the River Thames to the south.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.71 Noise sources within this LLCA include traffic along Princess Margaret Road, landfill operations and occasional river traffic. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, one location has been surveyed and is reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise level:

a. A-NML9 (Princess Margaret Road) – 51.0dB $L_{Aeq\ 3\ hour}$

1.3.72 The overall level of tranquillity in the LLCA is negatively influenced by some noise and visual intrusion, including built form in East Tilbury and landfill operations. While there is a degree of visual intrusion from built form and infrastructure at London Gateway Port and passing ships along the River Thames, the overall effect on tranquillity is limited within the expansive open landscape.

Environmental Lighting Zones

1.3.73 The Mucking Marshes LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone. East Tilbury has been defined as E3 medium district brightness due to the presence of light sources and associated skyglow. Further information is presented in Annex B.

Assessment of landscape value

1.3.74 Mucking Marshes is a locally valued landscape which contains heritage assets and some PRoWs of recreational value. It is not a designated landscape and is influenced by detracting features, including landfill operations and the nearby London Gateway Port.

1.3.75 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium

by virtue of its condition, cultural associations, recreational value and perceptual aspects.

Tilbury Marshes

General description and key characteristics

1.3.76 This large-scale marshland landscape is in the Green Belt and is an open, exposed, flat, low-lying area immediately adjacent to the north bank of the River Thames. It comprises predominantly arable farmland and areas that have been used for landfill, with smaller concentrations of rough grazing land. The enclosure pattern is defined by straight ditches and dykes creating predominantly rectilinear field shapes, particularly in the west of the LLCA. To the east, fields are larger with irregular boundaries.

1.3.77 In the south of the area adjacent to the River Thames, there are markedly different buildings and features that visually articulate the long settlement period of this landscape and its changing function. The historic Tilbury Fort sits at the south-west extent of the area, adjacent to a busy industrial zone including Tilbury Docks. Powerlines and raised landfill sites form notable features within the landscape.

1.3.78 There are few roads within much of the LLCA, although the Tilbury Loop railway line crosses the landscape. A new road link runs parallel and to the south of the railway line between the A1089 Dock Approach Road and Tilbury2.

1.3.79 This area has a strong visual link with the Chadwell Escarpment Urban Fringe LLCA to the north, with the tower of St James' Church, West Tilbury forming a skyline landmark. To the south is the open, low-lying Thames Estuary with the Kent landscape beyond.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.80 Noise sources within this LLCA include landfill operations and occasional river traffic. Noise surveys have been undertaken at one location with the following ambient noise level:

a. Footpath 146 (Two Forts Way)/NCN route 13 on the bank of the River Thames (Location Land 5) – 42.6 dB $L_{Aeq\ 3\ hour}$

1.3.81 Full details of the results are presented in Annex A. The survey indicates that there are low levels of noise within the undeveloped parts of this LLCA, such as along Two Forts Way. Here the lower levels of noise and presence of fewer built features results in a greater level of tranquillity compared to the rest of the LLCA, although passing ships on the River Thames introduce visual intrusion. The overall level of tranquillity in the LLCA is negatively influenced by some noise and visual intrusion from landfill operations, as well as visual intrusion from OHLs, cranes at Tilbury Docks, Tilbury Sewage Treatment Works, the urban edges of Tilbury and Gravesend, and isolated properties in West Tilbury.

Environmental Lighting Zones

1.3.82 The Tilbury Marshes LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, although light sources at Tilbury Docks (E4 high district brightness) and Tilbury Sewage Treatment Works (E3 medium district brightness) and associated skyglow are evident to the south and west. Light sources and skyglow from Gravesend are also evident to the south. Night-time

representative viewpoints N-02 and N-04 illustrate light sources evident from within the Tilbury Marshes LLCA. Further information is presented in Annex B.

Assessment of landscape value

1.3.83 The Tilbury Marshes LLCA contains heritage assets and PRoWs of recreational value, as well as a visitor attraction at Tilbury Fort. However, it is heavily influenced by Tilbury Docks, the Tilbury Sewage Treatment works, OHLs and landfill operations.

1.3.84 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, notwithstanding its cultural associations and recreational value, the overall value of the LLCA is concluded to be low as a result of the landscape condition and presence of detracting features.

Chadwell Escarpment Urban Fringe

General description and key characteristics

1.3.85 The LLCA encompasses a steep-sided, south-facing sand and gravel escarpment, which marks the edge of the lowest part of the Thames Terraces. Although relatively low in height, the escarpment provides a marked contrast to the flat Tilbury Marshes to the south.

1.3.86 This landscape is in the Green Belt and is defined by an escarpment orientated east to west and indented by small dry valleys. This is a small-scale, intimate landscape interspersed with small copses, areas of scrub and irregular fields of rough grassland and pasture, with some arable. It also includes narrow and winding lanes enclosed by hedgerows.

1.3.87 The tower of the Grade II* listed St James' Church within the small settlement of West Tilbury is a focal point on the skyline. Other than West Tilbury, the settlement pattern consists of a series of individual historic farmsteads. This is an urban fringe landscape where OHLs and major roads and housing around Chadwell St Mary influence character. The Tilbury Loop railway line crosses the eastern end of the LLCA.

1.3.88 This LLCA has a strong association with Tilbury Marshes to the south, the Thames Estuary and the landscape of Kent beyond.

Landscape baseline noise surveys and conclusions on tranquillity

1.3.89 Within this linear landscape, noise sources vary, but include the urban areas of Chadwell St Mary to the west (including vehicles on the road network) and Readmans Industrial Estate to the east, where passing trains on the Tilbury Loop railway line are audible. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. ST-NML3 (Station Road (Gravel Pit Cottages)) – 52.6dB $L_{Aeq\ 12\ hour}$

b. ST-NML4 (Station Road (Near Tilbury Loop)) – 60.1dB $L_{Aeq\ 12\ hour}$

c. A-NML10 (Norrsken (Near Station Road)) – 52.3dB $L_{Aeq\ 12\ hour}$

1.3.90 The overall level of tranquillity in the LLCA is negatively influenced by some noise and/or visual intrusion from Station Road and the Tilbury Loop railway line, as well as OHLs crossing the landscape and built form at Chadwell St Mary and Readmans Industrial Estate.

Environmental Lighting Zones

1.3.91 The Chadwell Escarpment Urban Fringe LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, with skyglow evident from nearby urban areas, including Tilbury Docks. Further information is presented in Annex B.

Assessment of landscape value

1.3.92 The Chadwell Escarpment Urban Fringe LLCA is a locally valued landscape, which provides the backdrop to heritage assets and reclaimed marshland within

the adjacent Thames Marshes. The LLCA also contains locally important biodiversity sites and some PRoWs of recreational value.

1.3.93 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, cultural associations, recreational value and perceptual aspects.

1.4 Green Belt/areas beyond setting of the Kent Downs AONB

The Landscape Assessment of Kent (Kent County Council, 2004)

Dartford and Gravesend Fringes

General description and key characteristics

1.4.1 This LLCA comprises pockets of land that have become isolated from the wider countryside to the south by the A2 and which are now sandwiched between the road and the extensive urban edges of Dartford and Gravesend. These are influenced to varying degrees by urban fringe land uses and features. Although the land uses vary, these areas have in common the A2 route corridor which forms the southern boundary, containment by hard urban edges on all other boundaries and strong urban influences both within and/or on their peripheries. This area has lost most of its former agricultural uses, woodland and orchards. Although a relatively small tract of land compared to some of the other LLCAs in the study area, its fragmented nature and the varying pressures and needs of the adjoining urban areas have resulted in a varied pattern of landcover.

1.4.2 Each isolated pocket of landscape within this LLCA has its own discrete character, but all fall generally into the transitional 'fringe' categories because of the pervasive influences of the urban or suburban context within which they are located. They are distinguished partly by land use differences, typically semi-natural heathland/grassland and regenerating woodland areas with minimum intervention in the study area.

1.4.3 There is very little continuity of time-depth in the landscape. Historic cores to settlements are no longer apparent and there are very few characteristic farmland remains; most have only remnant hedgerow and tree cover. The lack of distinctive features and current dominant elements of the landscape, such as road networks and urban development, devalues the sense of place.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.4 Noise sources within the LLCA include road traffic along the A2 and activity within the urban fringe environment, such as local traffic along Hall Road and within the surrounding residential areas. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, one location has been surveyed and is reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML34 (Ackers Drive) – 64.3 dB $L_{Aeq\ 3\ hour}$

1.4.5 Noise and visual intrusion associated with the A2, minor roads, buildings, large car parks and the HS1 railway line negatively influence the level of tranquillity. Linear vegetation belts along roads and HS1 limit visual intrusion locally. Topography also reduces noise from the A2 in places, as noted in Appendix 12.5 Baseline Noise Survey Information at location A-NML 34, although traffic is still audible.

Environmental Lighting Zones

1.4.6 The Dartford and Gravesend Fringes LLCA lies within both the E3 medium district brightness and E2 low district brightness Environmental Lighting Zones. The A2 street lighting is a dominant night-time feature and further light sources within Gravesend are notable. Further information is presented in Annex B.

Assessment of landscape value

1.4.7 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is low, due to its condition, limited recreational value and presence of detracting features.

Thurrock Landscape Capacity Study (Thurrock Council, 2005)

West Tilbury Urban Fringe

General description and key characteristics

1.4.8 This LLCA is an urban fringe landscape within the Green Belt, comprising a broad swathe of gently undulating, open, large-scale arable farmland between Chadwell St Mary and East Tilbury. Its north-eastern boundary is defined by rising landform associated with the Linford/Buckingham Hill LLCA, with its west and southern boundaries defined by Chadwell St Mary and the Chadwell escarpment respectively. The urban edges are generally abrupt with very little softening by vegetation or landform. Horse paddocks and industrial areas at the south-eastern edge of Chadwell St Mary influence the landscape character locally. To the south-east are the low-lying LLCAs of Mucking Marshes and Tilbury Marshes.

1.4.9 Tree cover is limited and where hedgerows have not been lost, they typically occur along historic lanes and tracks such as Hoford Road Protected Lane. Localised small copses and areas of scrub are found around West Tilbury, Low Street, and east of Princess Margaret Road around Coalhouse Battery.

1.4.10 Settlement within this LLCA is concentrated towards the eastern boundary with the pattern throughout the area being predominantly scattered farm buildings. The LLCA is crossed by a network of minor roads and lanes that carry occasional heavy traffic associated with local mineral works within the Linford/Buckingham Hill LLCA and a small quarry along High House Lane. The Tilbury Loop railway line crosses the eastern half of the area. Pylons and powerlines are dominant features traversing north to south across the middle of the LLCA. Readmans Industrial Estate and a solar farm are notable features at the south-east of the LLCA.

1.4.11 The East Tilbury (Bata) Conservation Area, which was designed and built to house the workforce of the British Bata Shoe Company, lies at the east edge of the LLCA.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.12 Noise sources within this LLCA include the urban areas of Chadwell St Mary and East Tilbury and traffic along roads such as Muckingford Road. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. LT-NML6 (Beechcroft Avenue) – 53.2dB $L_{Aeq\ 12\ hour}$

b. A-NML11 (Muckingford Road) – 57.5dB $L_{Aeq\ 3\ hour}$

c. A-NML12 (High House) – 52.2dB $L_{Aeq\ 3\ hour}$

1.4.13 The overall level of tranquillity in the LLCA is negatively influenced by some noise and visual intrusion from Muckingford Road, a small quarry near High House Lane, OHLs crossing the landscape and built form at Chadwell St Mary and East Tilbury. The minor, rural nature of Hoford Road Protected Lane

positively influences the level of tranquillity locally, with its banks and vegetation serving to limit visual intrusion.

Environmental Lighting Zones

1.4.14 The West Tilbury Urban Fringe LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, with limited light sources. Perceivable light sources include the London Gateway Port and skyglow resulting from the urban areas of Tilbury and Chadwell St Mary, as illustrated by night-time representative viewpoints N-09 and N-12. Further information is presented in Annex B.

Assessment of landscape value

1.4.15 The West Tilbury Urban Fringe LLCA is a locally valued landscape which provides the backdrop to heritage assets and contains some PRoWs of recreational value.

1.4.16 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, cultural associations, recreational value and perceptual aspects.

Linford/Buckingham Hill Urban Fringe

General description and key characteristics

1.4.17 This urban fringe landscape is in the Green Belt and forms a locally distinctive area of elevated landform, which comprises a visually prominent, broad, flat to undulating, rounded ridge plateau. The south-western slope rising from a minor watercourse forms a prominent edge to the LLCA, emphasised by a tree belt.

1.4.18 This landscape has a diverse range of land uses including mixed arable and pasture fields, mineral extraction, industry, landfill and St Cleres Hall Golf Club. Some of the landfill areas have been restored to rough grassland and scrub with informal recreational routes, although they still form notable areas of raised land, particularly along Buckingham Hill Road. The Tarmac Linford Blocks Plant is enclosed by dense woodland, screening much of the site apart from taller elements such as chimneys. Rainbow Wood is an area of ancient woodland (identified during surveys as part of the Project) abutting an operational quarry along Hoford Road. Hoford Road is a protected lane, typically sunken and lined by hedgerows and tree belts.

1.4.19 The settlement pattern consists of the village of Linford and dispersed farm buildings. New housing within Stanford-le-Hope borders the LLCA to the north-east.

1.4.20 From the higher ground there are extensive views out to the Thames Estuary and Kent hills to the south, and Langdon hills to the north. Pylons and OHLs are visually intrusive features within this LLCA.

Tranquillity

1.4.21 As only the south-western edge of the LLCA would be affected by the Project, there are no landscape-specific noise survey locations or survey locations in Appendix 12.5: Baseline Noise Survey Information within this LLCA.

1.4.22 Noise sources vary within the LLCA but include the urban area of Linford and occasional vehicles using the road network. The quarry and Tarmac site also provide notable background noise sources within the landscape.

1.4.23 Noise and visual intrusion associated with the surrounding urban edge, minor roads and the Tarmac site, together with visual intrusion from OHLs and pylons along the skyline, negatively influence the level of tranquillity. The minor, rural nature of Hoford Road Protected Lane positively contributes to the overall level of tranquillity locally, with its banks and vegetation serving to limit visual intrusion.

Environmental Lighting Zones

1.4.24 The Linford/Buckingham Hill Urban Fringe LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, with limited light sources. However, there are light sources evident at Chadwell St Mary, with distant light sources evident at the London Gateway Port and within the urban area of Tilbury, which have an effect on skyglow. Further information is presented in Annex B.

Assessment of landscape value

1.4.25 The LLCA is a locally valued landscape, which contains locally important biodiversity sites, as well as some PRoWs of recreation value.

1.4.26 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium, by virtue of its condition, recreational value and perceptual aspects.

White Croft/Orsett Heath Urban Fringe

General description and key characteristics

1.4.27 This urban fringe landscape is in the Green Belt to the north of Grays and north-east of Chadwell St Mary. The area predominantly consists of gently undulating, medium- to large-scale arable farmland strongly influenced by the presence of transport corridors and utilities infrastructure. At the centre of the area is a bowl-shaped farmland landscape near The Whitecroft (also marked White Crofts on Ordnance Survey mapping). The hedgerow-lined Hornsby Lane, along with the adjoining Grade II listed Heath Place and its grounds, provide a sense of the former rural farmland landscape. Tree cover is generally limited to the settlement edges and screen planting along the A13 corridor and at the existing A13/A1089 junction, although some planting has recently been removed along the A13 east of the Orsett Cock junction to accommodate road widening works. There are also larger tree belts at Orsett Golf Club. Recreational green spaces are present along the urban edge of Grays, including King George's Field. Blackshots Nature Area is a large area of rough grassland supporting invertebrates and nesting birds adjacent to the existing A13/A1089 junction.

1.4.28 The settlement pattern consists of Orsett Heath and Southfields, as well as isolated farms and residential properties connected by occasional minor roads. The area is influenced by the northern urban edge of Chadwell St Mary, the north-eastern urban edge of Grays and the existing A13/A1089 junction south of Baker Street. Tall tower blocks within the urban edge are particularly prominent along Godman Road in Chadwell St Mary and Long Lane in Grays, as are pylons and OHLs crossing the landscape. A small quarry influences the landscape to the west of the settlement of Southfields.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.29 Noise sources within the LLCA include road traffic along the A13, which affects the surrounding landscape due to the elevation of the road to the east of the existing junction with the A1089 Dock Approach Road. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, five locations have been surveyed and are reported in Appendix 12.5 Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML13 (Heath Road) – 64.3dB $L_{Aeq\ 3\ hour}$

b. A-NML14 (Heath Place) – 59.3dB $L_{Aeq\ 3\ hour}$

c. A-NML15 (The Whitecroft) – 62.5dB $L_{Aeq\ 3\ hour}$

d. A-NML19 (Welling Road) – 66.9dB $L_{Aeq\ 3\ hour}$

e. LT-NML7 (Willow Garden Day Nursery) – 54.1dB $L_{Aeq\ 12\ hour}$

1.4.30 The survey indicates that background road traffic noise is apparent from the A13, A1013 Stanford Road and A1089 Dock Approach Road, as well as surrounding minor roads. There are particularly elevated noise levels at Heath Road, The Whitecroft and Welling Road, which are in close proximity to busy roads.

1.4.31 Noise sources from the A13, A1013 Stanford Road, A1089 Dock Approach Road and surrounding minor roads negatively influence the level of tranquillity in the LLCA. In addition, visual intrusion associated with OHLs, traffic movements, highway infrastructure and buildings along the urban edges of Chadwell St Mary and Grays also negatively influence the level of tranquillity.

Environmental Lighting Zones

1.4.32 The White Croft/Orsett Heath Urban Fringe LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone. Light sources are evident from adjacent settlements at the urban edge and the A13 which contribute to localised skyglow, as illustrated by night-time representative viewpoint N-19. Further information is presented in Annex B.

Assessment of landscape value

1.4.33 The LLCA is a locally valued landscape, which contains a locally important biodiversity site, heritage assets and some PRoWs of recreational value.

1.4.34 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded the value of the LLCA is medium, by virtue of its condition, cultural associations, recreational value and perceptual aspects.

Land of the Fanns Landscape Character Assessment (Land of the Fanns Landscape Partnership, 2016)

1.4.35 The 'Land of the Fanns' is an area of historic fenland named by the Land of the Fanns Landscape Partnership, which is an initiative seeking to provide a coherent and structured approach to restoring the landscape, educating communities and providing opportunities for people to learn new skills and appreciate the heritage around them.

1.4.36 Thurrock Council's Landscape Capacity Study is partially overlapped by the more recent Land of the Fanns Landscape Character Assessment. For the purposes of this LVIA, the A13 and the urban area of Grays have therefore been taken as the transition between the two landscape character assessments used to inform the Project's assessment. The LLCAs shown in Figure 7.2 (Application Document 6.2) are based on the Thurrock Landscape Capacity Study south of the A13/east and north-east of Grays and the more recent Land of the Fanns Landscape Character Assessment to the north of the A13/west of Grays.

1.4.37 The descriptions of the following LLCAs have been based on the published Land of the Fanns Landscape Character Assessment but have been refined through detailed study and analysis undertaken for this LVIA. In addition, it is considered that the expansive Thurrock Reclaimed Fen LLCA, typically a low-lying, large-scale, flat, inland basin associated with the upper reaches of the Mardyke, has a different character when compared with Thames Chase Forest Centre due to the presence of woodland and its slightly elevated position. Therefore, for the purposes of this assessment the following modification has been made:

a. Subdivision of Thurrock Reclaimed Fen into two distinct sub areas of Thames Chase and the Mardyke

Orsett Lowland Farmland

General description and key characteristics

1.4.38 The Orsett Lowland Farmland LLCA falls within the Greater London Green Belt but outside of the Thames Chase Community Forest area. The LLCA is a low-lying, gently undulating fen edge landscape focused on the historic nucleated settlement of Orsett. Small-scale pasture fields adjoin the settlements of Baker Street, Orsett and Horndon-on-the-Hill, with medium- to large-scale arable fields further from the settlement edges. There is also a pattern of small woodland blocks in the farmland and along settlement edges, with mature hedgerows and hedgerow trees along minor roads and some field boundaries.

1.4.39 There is a relationship with the open, large-scale Thurrock Reclaimed Fen LLCA, with some extensive views across it to the north from higher ground. This landscape also has a historical relationship with the former heathland at Orsett Heath to the south, now severed by the A13. Traffic and highway infrastructure along the A13 influence the southern edge of the LLCA and OHLs are prominent to the west of Orsett and east of the A128.

1.4.40 The LLCA has considerable time depth and a long history of occupation which is reflected in the settlement patterns, enclosure patterns and historic sites. There is a notable concentration of scheduled monuments including a cropmark complex west of Orsett, Iron Age enclosures at Baker Street and Bishop Bonner's Palace north of Orsett. Orsett and Horndon-on-the-Hill are conservation areas and the area as a whole contains a high concentration of listed buildings. The Grade II listed Baker Street Windmill at the western edge of the Baker Street settlement is a local landmark.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.41 The dominant noise source in the LLCA is traffic on the A13, which affects the surrounding landscape due to the elevated nature of the road to the east of the existing junction with the A1089 Dock Approach Road. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML18 (Baker Street) – 67.6dB $L_{Aeq\ 3\ hour}$

b. A-NML20 (Stifford Clays Road (Near Baker Street)) – 73.1dB $L_{Aeq\ 3\ hour}$

c. ST-NML5 (Fen Lane (Old Rectory)) – 53.5dB $L_{Aeq\ 12\ hour}$

1.4.42 The survey indicates that road traffic noise is apparent from the A13, A1089 Dock Approach Road slip road and minor roads, with particularly elevated noise levels when in close proximity to busy roads. At location ST-NML5, traffic along the A13 is stated in Appendix 12.5 Baseline Noise Survey Information as being a ‘background’ noise source.

1.4.43 Noise sources from the A13, A1089 Dock Approach Road slip road and surrounding minor roads negatively influence the level of tranquillity in the LLCA. In addition, visual intrusion associated with OHLs, traffic movements and buildings in Orsett and Baker Street also negatively influences the level of

tranquillity. There are greater levels of tranquillity further north within the LLCA away from the A13 and urban edge.

Environmental Lighting Zones

1.4.44 The Orsett Lowland Farmland LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone. Light sources are evident from adjacent settlements at the urban edge and along the A13 and A1089 Dock Approach Road slip road, which contribute to localised skyglow. Some skyglow is evident in the night-time representative viewpoint N-27 looking east. Further information is presented in Annex B.

Assessment of landscape value

1.4.45 This is a locally valued landscape, which contains numerous heritage assets mainly focused on the historic nucleated settlement of Orsett.

1.4.46 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium, by virtue of its condition, cultural associations and perceptual aspects.

Thurrock Reclaimed Fen (sub area Mardyke)

General description and key characteristics

1.4.47 The Thurrock Reclaimed Fen (sub area Mardyke) LLCA is in the Green Belt and forms the focus of the Fanns landscape. The west and north-west part of the area fall within the Thames Chase Community Forest. It is a low-lying, large-scale, flat inland basin associated with the upper reaches of the Mardyke. It is a predominantly open, sparsely settled arable landscape with a strong sense of place, remoteness and tranquillity, with expansive views across the area. The lowest-lying part is Orsett Fen where the field boundaries are delineated by open ditches. The landscape is defined by rectilinear features, such as former fen causeways, drainage ditches, gappy field boundary hedgerows and infrequent woodland blocks such as Fen Covert, The Wilderness and Clay Tye Wood (an ancient woodland). The Mardyke watercourse is a notable feature in the landscape due to the frequent tree belts that line its bank.

1.4.48 Bulphan village is present within the LLCA, along with numerous scattered farms and residential properties linked by minor lanes. Top Meadow Golf Club, Puddledock Farm Fishery and Grangewaters Outdoor Education Centre provide formal recreational opportunities. There are also several PRoWs crossing the landscape, including the Mardyke Way.

1.4.49 OHLs contrast with the largely remote and rural nature of the landscape. A landfill site east of South Ockendon also influences the landscape, as well as the M25 corridor and the Upminster to Basildon railway in the northern part of the LLCA.

1.4.50 This landscape contrasts with the rising wooded slopes within both the Brentwood hills to the north and the Langdon hills and farmland to the east.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.51 Due to the sparsely settled nature of the central part of this LLCA, noise sources are limited. Noise sources within the wider LLCA include aircraft, minor roads, isolated settlements, the A13, the M25 and a landfill site near South Ockendon. Noise surveys have been undertaken at seven locations with the following ambient noise levels monitored:

a. The Mardyke Way (Location A1) on bridleway 219 – 51.6dB $L_{Aeq\ 1\ hour}$

b. The Mardyke Way (Location A2) on bridleway 219 – 42.6 to 46.1dB $L_{Aeq\ 1\ hour}$

c. The Mardyke Way (Location A3) on bridleway 219 – 42.9 to 43.7dB $L_{Aeq\ 1\ hour}$

d. Footpath 90 (Location A4) – 44.4dB $L_{Aeq\ 3\ hour}$

e. Parkers Farm Road (rural lane) adjacent to footpath 100 (Location A5) – 55.6dB $L_{Aeq\ 3\ hour}$

f. Footpath 132 (Location LT-NML12 reported in Appendix 12.5 Baseline Noise Survey Information) – 46.9dB $L_{Aeq\ 12\ hour}$

g. Latchford Farm Aquatics, St Marys Lane, Upminster (Location LT-NML15 reported in Appendix 12.5: Baseline Noise Survey Information) – 62.8dB $L_{Aeq\ 12\ hour}$

1.4.52 Full details of the results are presented in Annex A and Appendix 12.5: Baseline Noise Survey Information. These results indicate that traffic noise from surrounding minor roads is apparent, such as at locations A1 and A5, with aircraft noise also audible. Noise from the A13 is stated in Annex A as being 'distant' or 'background'. Along the north-western edge of the LLCA, traffic noise from the M25 is notable, as noted in Appendix 12.5: Baseline Noise Survey Information at location LT-NML15. Away from minor roads and the M25, the noise levels are lower as recorded at locations A2, A3, A4 and LT-NML12.

1.4.53 There are some noise sources that negatively influence the level of tranquillity, including the A13, M25, minor roads, aircraft and a landfill site near South Ockendon. In addition, roads, including moving vehicles, OHLs, raised areas of land and vehicles at the landfill site, and occasional buildings introduce visual intrusion. However, negative influences on tranquillity are localised, and within the wider LLCA the level of tranquillity is greater with a peaceful, rural feel and a sense of remoteness. The presence of natural features, such as woodland blocks and the prominence of expansive arable fields, also positively influence tranquillity.

Environmental Lighting Zones

1.4.54 The Thurrock Reclaimed Fen (sub area Mardyke) LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, with light sources evident within Chadwell St Mary and Chafford Hundred. However, there is a substantial area of E1 intrinsically dark landscape in the core low-lying area of the LLCA, which is evident in the night-time representative viewpoint N-27. Bulphan village has been assessed as an area of E3 medium district brightness. Further information is presented in Annex B.

Assessment of landscape value

1.4.55 The Thurrock Reclaimed Fen (sub area Mardyke) LLCA is a locally valued, unique landscape, which forms the focus of the Fanns landscape and contains PRoWs of recreational value including the Mardyke Way.

1.4.56 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is high, by virtue of its condition, recreational value and perceptual aspects.

Thurrock Reclaimed Fen (sub area Thames Chase)

General description and key characteristics

1.4.57 The Thurrock Reclaimed Fen (sub area Thames Chase) LLCA is in the Green Belt and forms a key part of the Fanns landscape and the Thames Chase Community Forest. The landscape is typically wooded in nature, occupying a slightly elevated position above the wider fen landscape to the east, from which it is severed by the M25 corridor.

1.4.58 There are a diverse range of land uses within the LLCA. The Thames Chase Forest Centre is located to the west of the M25, which provides a base for recreation within the surrounding woodland and green space. There are also arable and pasture fields, a solar farm, Cranham Golf Club and recreational green spaces at the urban edge of Upminster. There are also several nature conservation designations along the edge of Upminster comprising areas of woodland, meadows and scrub, such as Cranham Brickfields and Franks Wood, part of which is ancient woodland. Tree belts along the Upminster to Grays railway line along the western boundary of the LLCA have also been identified as ancient woodland during surveys as part of the Project.

1.4.59 Settlement is limited to scattered residential properties and businesses. There are several busy transport routes, the most dominant of which is the M25. The A127, B187, Upminster to Basildon railway line and Upminster to Grays railway line also cross or border the LLCA.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.60 The dominant noise source is traffic along the M25, which affects the surrounding landscape. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, two locations have been surveyed and are reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML26 (St Mary's Lane) – 68.1dB $L_{Aeq\ 3\ hour}$

b. A-NML27 (In Fitness In Health, St Marys Lane, Upminster) – 67.9dB $L_{Aeq\ 3\ hour}$

1.4.61 Noise from the M25 and surrounding minor roads, and distant noise from aircraft, negatively influences the level of tranquillity in the LLCA. This is particularly prominent where visual intrusion associated with traffic movements, highway infrastructure and buildings along the urban edge of Upminster is also evident. Woodland within Thames Chase Forest Centre increases the level of tranquillity locally.

Environmental Lighting Zones

1.4.62 The Thurrock Reclaimed Fen (sub area Thames Chase) LLCA mostly falls within the E2 low district brightness Environmental Lighting Zone, with light pollution evident as a result of the M25 and the urban edge of Upminster. Further information is presented in Annex B.

Assessment of landscape value

1.4.63 The Thurrock Reclaimed Fen (sub area Thames Chase) LLCA is a locally valued landscape, which contains several areas of recreational value.

1.4.64 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, recreational value and perceptual aspects.

Belhus Lowland Quarry Farmland

General description and key characteristics

1.4.65 The Belhus Lowland Quarry Farmland LLCA is located within the Thames Chase Community Forest and Green Belt. This area has historically been extensively quarried for aggregate with subsequent landfill, which is evident in the landscape and tree planting associated with the restoration of former extraction/landfill sites and the numerous waterbodies to the west of the M25 and east of South Ockendon.

1.4.66 This is a low-lying, predominantly flat, mixed arable and pasture landscape. Fields are of varying sizes and shapes and interspersed with numerous tree belts and woodland blocks. Spring Wood, Whitehall Wood and Oak Wood are designated as ancient woodland and tree belts along the Upminster to Grays railway line (both sides of the M25) have also been identified as ancient woodland during surveys as part of the Project. Within the farmland are several recreational areas, including Belhus Woods Country Park, Stubbers Adventure Centre and Cranham Marsh, which also have local ecology designations.

1.4.67 South Ockendon is the main settlement within the LLCA with smaller settlements, such as North Ockendon and isolated residential properties and farms, scattered within the farmland. The M25 is a prominent feature in the centre of the LLCA, with additional influences from the Upminster to Grays railway line and wind turbines between the M25 and South Ockendon. Also between the M25 and South Ockendon is a former extraction/landfill site, which is in the process of being restored to form Little Belhus Country Park.

1.4.68 There are heritage assets within the northern part of the LLCA, including conservation areas at North Ockendon and Cranham and the Grade II listed Cranham Hall and Harwood Hall to the west of the M25. Belhus Park Grade II Registered Park and Garden is in the south-west of the LLCA and includes mature woodland and former parkland. The Grade II listed Ockendon Hall and the scheduled monument nearby, Roman barrow, lie to the north-east of South Ockendon and provide locally important features in the landscape, particularly as they are associated with established mature vegetation.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.69 The dominant noise source is traffic on the M25, which affects the surrounding landscape. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise levels monitored:

a. A-NML22 (Cheelson Road) – 57.1dB $L_{Aeq\ 3\ hour}$

b. A-NML44 (Dennises Lane) – 67.1dB $L_{Aeq\ 3\ hour}$

c. ST-NML7 (Field House (Dennises Lane)) – 53.6dB $L_{Aeq\ 12\ hour}$

1.4.70 The survey indicates that road traffic noise from the M25 and surrounding minor roads is apparent, with elevated noise levels at location A-NML44, which is in close proximity to the M25. At locations A-NML22 and ST-NML7, noise levels are influenced by the B186 North Road and Dennis Road respectively, with

traffic along the M25 stated in Appendix 12.5: Baseline Noise Survey Information as being a 'background' noise source.

1.4.71 Noise from the M25 and surrounding minor roads negatively influences the level of tranquillity in the LLCA. In addition, visual intrusion associated with traffic movements, buildings in South Ockendon and trains along the Upminster to Grays railway line also negatively influences the level of tranquillity. There are greater levels of tranquillity away from transport infrastructure and the urban edge, particularly where woodland limits visual intrusion, for example within Belhus Woods Country Park.

Environmental Lighting Zones

1.4.72 The Belhus Lowland Quarry Farmland LLCA largely falls within the E2 low district brightness Environmental Lighting Zone, with an area of E3 medium district brightness at South Ockendon. Prominent light sources are present along the M25, with skyglow from the M25 and surrounding urban areas at South Ockendon and Upminster evident in night-time representative viewpoint N-40. Further information is presented in Annex B.

Assessment of landscape value

1.4.73 This LLCA is a locally valued post-industrial landscape, with heritage assets and PRoW and country park areas of recreational value.

1.4.74 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded that the value of the LLCA is medium by virtue of its condition, cultural associations, recreational value and perceptual aspects.

Brentwood Wooded Hills

General description and key characteristics

1.4.75 The Brentwood Wooded Hills LLCA is located within the Thames Chase Community Forest and Green Belt. The landform is undulating and generally rises northwards towards higher ground at Brentwood. Farmland is a mixture of pasture and arable with fields of varying shapes and sizes. North-east of M25 junction 29, there are medium- to large-scale, irregularly shaped arable fields with small tree belts and woodland blocks. West of the M25 and further north around Great Warley, there are small-scale pasture fields, which are generally bounded by dense hedgerow boundaries. Large woodland blocks are present in the pasture fields, such as at Foulkes Wood and adjoining Beredens Lane. Large woodland blocks and tree belts are also present at M25 junction 29, including ancient woodland at Codham Hall Wood. Several other areas of ancient woodland are present throughout the LLCA, including Hobbs Hole Wood, Warley Hall Wood, Coombe Wood, and Jackson's Wood. Jermains Wood has also been identified as ancient woodland during surveys as part of the Project.

1.4.76 The settlement pattern is predominantly scattered residential properties, farms, hamlets and villages connected by rural lanes. Great Warley is designated as a conservation area and contains several listed buildings, and Warley Place is a Grade II Registered Park and Garden which includes the remnants of a designed garden. Warley Place is also managed by Essex Wildlife Trust as a nature reserve. The spire of the Grade I listed St Mary's Church to the south of Great Warley provides a landmark feature within the surrounding farmland.

1.4.77 The M25 dominates the centre of the LLCA, which is otherwise largely free of detracting features. However, some industrial units, such as at Codham Hall Farm which are largely focused around M25 junction 29, influence the landscape locally.

1.4.78 The elevated slopes of this LLCA have extensive views to the south and across the Thurrock Reclaimed Fen, giving rise to a strong relationship with this large-scale, low-lying landscape.

Landscape baseline noise surveys and conclusions on tranquillity

1.4.79 The dominant noise source is traffic on the M25, which affects the surrounding landscape. No landscape-specific noise monitoring locations have been recorded within this LLCA. However, three locations have been surveyed and are reported in Appendix 12.5: Baseline Noise Survey Information with the following ambient noise levels monitored:

a. ST-NML8 (The Kilns Hotel) – 55.0dB $L_{Aeq\ 12\ hour}$

b. A-NML28 (Folkes Lane) – 66.4dB $L_{Aeq\ 3\ hour}$

c. LT-NML16 (Beredens Lane) – 60.4dB $L_{Aeq\ 12\ hour}$

1.4.80 The survey indicates that traffic noise from the M25 is dominant within the LLCA when in close proximity, as recorded at locations A-NML28 and LT-NML16. Traffic noise from the A127 and minor roads is also apparent. The overall level

of tranquillity in the LLCA is negatively influenced by noise and visual intrusion from the M25 and the urban areas of Upminster, Romford and Brentwood. Away from transport infrastructure and the urban edge, in the more rural, farmland areas where people are largely absent, the level of tranquillity is greater. This is particularly evident where woodland limits visual intrusion, for example at Folkes Lane Wood west of the M25 and at Thorndon Country Park.

Environmental Lighting Zones

1.4.81 The Brentwood Wooded Hills LLCA falls largely within the E2 low district brightness Environmental Lighting Zone, although there are prominent light sources from the M25. Further information is presented in Annex B.

Assessment of landscape value

1.4.82 The Brentwood Wooded Hills LLCA is a locally valued, accessible, attractive woodland landscape, which has ancient woodland and PRoWs and country park areas of recreational value.

1.4.83 In accordance with the methodology set out in Chapter 7: Landscape and Visual (Application Document 6.1) and Appendix 7.2: Landscape and Visual Assessment Methodology, it is concluded the value of the LLCA is high, by virtue of its condition, habitat diversity, cultural associations, recreational value and perceptual aspects.

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Annex A Landscape (tranquillity) baseline noise surveys

A.1 Summary

A.1.1 Ambient weekday noise surveys have been undertaken at 21 locations between 07:00 and 19:00 to supplement the landscape assessment and impacts on tranquillity.

A.1.2 The measured weekday ambient levels expressed in dB $L_{Aeq(T)}$ at each location are presented in Table A.1.

Table A.1 Weekday ambient noise levels

Location (refer to Figure 7.6 (Application Document 6.2))	Duration (T)	Ambient noise level dB $L_{Aeq(T)}$
Landscape A1 - Mardyke	1-hour	51.6 - 51.6
Landscape A2 - Mardyke	1-hour	42.6 - 46.1
Landscape A3 - Mardyke	1-hour	42.9 - 43.7
Landscape A4 - Footpath 90	3-hour	44.4
Landscape A5 - Parkers Farm Road	3-hour	55.6
Landscape A7 - Ashenbank Woods	1-hour	50.5 - 52.6
Landscape A8 - Public Footpath NS179	1-hour	56.7 - 60.9
Landscape A9 - Public Footpath NS182	1-hour	44.5 - 53.0
Landscape A10 - Public Footpath NS321	1-hour	49.0 - 54.9
Landscape A11 - Jeskyns Statues	1-hour	47.9 - 53.4
Landscape A12 - Public Footpath NS161	1-hour	57.1 - 60.6
Landscape A13 - Shorne Woods Country Park car park	1-hour	53.2 - 56.7
Landscape A14 - Jeskyns Community Woodland	1-hour	53.9 - 55.9
Landscape A15 - Public Footpath NS179	1-hour	69.5 - 71.9
Landscape A16 - Shorne Woods	1-hour	46.6 - 48.6
Landscape 4 (Kent) - Shornemead Fort	3-hour	41.6
Landscape 5 (Essex) - Footpath 146	3-hour	42.6
Landscape 6 - Cardiac Hill	3-hour	53.4
Land 1 - Thong Lodge	12-hour	50.0 - 55.9
Land 2 - The Mount	12-hour	49.9 - 60.2
Inn on the Lake	12-hour	70.0 - 71.8

A.2 Introduction

A.2.1 Noise monitoring has been undertaken at 21 locations during the weekday between 07:00 and 19:00 across the study area to inform the landscape assessment and impacts on tranquillity. This is supplementary to the baseline noise surveys undertaken for the assessment in Chapter 12: Noise and Vibration (Application Document 6.1).

A.2.2 For landscape, the noise monitoring has focused on key landscape and visual receptors where tranquillity was considered of particular importance. It does not include all LLCAs. The locations have been agreed with stakeholders.

A.3 British Standards and guidance

A.3.1 The relevant British Standards and Guidance used in establishing existing background and ambient noise levels are detailed in the following section.

BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures

A.3.2 BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures (BS 7445-1) (British Standards Institution, 2003) defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.

A.3.3 The methods and procedures described in BS 7385-1 are intended to be applicable to sounds from all sources, individually and in combination, which contribute to the total noise level. This standard recommends that the requirement for the description of environmental noise is best met by adopting the equivalent continuous A-weighted sound pressure level as a basic quantity.

BS 7445-2:1991 Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use

A.3.4 BS 7445-2:1991 Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use (BS 7445-2) (British Standards Institution, 1991) provides guidance on the acquisition of data for measuring and describing environmental noise relevant to general land use.

A.3.5 This part of BS 7445 describes methods for the acquisition of data which provide descriptors that enable the following:

a. A description of the environmental noise in a specified area of land to be made in a uniform way

b. The compatibility of any land use activity or projected activity to be assessed with respect to existing or predicted noise

A.4 Methodology

Monitoring locations

A.4.1 Attended noise monitoring has been undertaken at 19 monitoring locations as specified in Table A.2 and presented in Figure 7.6 (Application Document 6.2).

Table A.2 Attended noise monitoring locations and durations

Location (refer to Figure 7.6 (Application Document 6.2))	ID	Duration	Date	Time
Landscape A1 (Essex) - Mardyke	A1	2x 1-hour surveys	06/28/2019	10:10 - 11:10
			06/28/2019	11:10 - 12:10
Landscape A2 (Essex) - Mardyke	A2	2x 1-hour surveys	22/05/2019	11:36 - 12:36
			22/05/2019	13:30 - 14:30
Landscape A3 (Essex) - Mardyke	A3	2x 1-hour surveys	22/05/2019	10:10 - 11:10
			22/05/2019	13:00 - 14:00
Landscape A4 (Essex) - Footpath 90	A4	3-hour survey	17/07/2019	10:00 - 13:00
Landscape A5 (Essex) - Parkers Farm Road (Adjacent Public Footpath)	A5	3-hour survey	16/07/2019	11:00 - 14:00
Landscape A7 (Kent) - Ashenbank Woods	A7	2x 1-hour surveys	28/03/1019	14:15 - 15:15
			01/05/2019	09:00 - 10:00
Landscape A8 (Kent) - Public Footpath NS179 Opposite Brewers Road	A8	3x 1-hour surveys	27/03/2019	13:45 - 14:45
			01/05/2019	10:30 - 11:30
			06/20/2019	15:45 - 16:45
Landscape A9 (Kent) - Public Footpath NS182	A9	3x 1-hour surveys	06/17/2019	09:50 - 10:50
			06/17/2019	10:50 - 11:50
			27/03/2019	15:25 - 16:25
Landscape A10 (Kent) - Public Footpath NS321	A10	3x 1-hour surveys	27/03/2019	10:30 - 11:30
			30/04/2019	12:15 - 13:15
			17/07/2019	15:30 - 16:30
Landscape A11 (Kent) - Jeskyns Statues	A11	3x 1-hour surveys	28/03/2019	15:50 - 16:50
			30/04/2019	08:55 - 09:55
			10/05/2019	11:05 - 12:05
	A12		27/03/2019	09:05 - 10:05

Location (refer to Figure 7.6 (Application Document 6.2))	ID	Duration	Date	Time
Landscape A12 (Kent) - Public Footpath NS161		2x 1-hour surveys	01/05/2019	12:05 - 13:05
Landscape A13 (Kent) - Shorne Woods Country Park car park	A13	3x 1-hour surveys	28/03/2019	11:05 - 12:05
			10/05/2019	09:25 - 10:25
			13/11/2019	13:23 - 14:23
Landscape A14 (Kent) - Jeskyns Community Woodland Carpark	A14	3x 1-hour surveys	28/03/2019	09:05 - 10:05
			30/04/2019	13:45 - 14:45
			10/05/2019	13:05 - 14:05
Landscape A15 (Kent) - Public Footpath NS179	A15	3x 1-hour surveys	27/03/2019	12:30 - 13:30
			30/04/2019	15:05 - 16:05
			09/05/2019	09:25 - 10:25
Landscape A16 (Kent) - Shorne Woods (just north of Inn on the Lake)	A16	3x 1-hour surveys	28/03/2019	12:35 - 13:35
			30/04/2019	10:45 - 11:45
			11/08/2019	12:00 - 13:00
Landscape 4 (Kent) - Shornemead Fort	Land 4	3-hour survey	23/05/2019	11:20 - 14:20
Landscape 5 (Essex) - Footpath 146	Land 5	3-hour survey	25/10/2018	11:15 - 14:15
Landscape 6 - Cardiac Hill	Land 6	3-hour survey	15/11/2018	11:25 - 14:25

A.4.2 Unattended noise monitoring has been undertaken at three monitoring locations as specified in Table A.3 and presented in Figure 7.6 (Application Document 6.2).

Table A.3 Unattended noise monitoring locations and durations

Location (refer to Figure 7.6 (Application Document 6.2))	Start date	End date
Land 1	15/07/2019 - 17:00	23/07/2019 - 09:00
Land 2	13/11/2019 - 00:00	20/11/2019 - 00:00
Inn on the Lake	15/07/2019 - 17:00	23/07/2019 - 10:00

Monitoring equipment

A.4.3 At all noise monitoring locations, sound level meters conforming to the following British Standards were used:

a. BS 61672-1:2013 Electroacoustics – Sound level meters, Part 1: Specifications

A.4.4 All sound level meters used during the survey at each location had an independent calibration to manufacturer's specification carried out no greater than two years prior to the survey completion date.

A.4.5 Details of the sound level meters used during the noise surveys are presented in Table A.4.

Table A.4 Sound monitoring equipment used for noise surveys

Equipment	Manufacturer	Model	Serial number	Calibration date
Sound Level Meter	ACOEM 01dB	FUSION	11035	09 Feb 2018
Sound Level Meter	ACOEM 01dB	FUSION	11036	09 Feb 2018
Sound Level Meter	ACOEM 01dB	CUBE	10696	03 July 2018
Sound Level Meter	ACOEM 01dB	CUBE	10692	03 July 2018
Sound Level Meter	ACOEM 01dB	CUBE	11893	26 November 2018

A.4.6 Field check-calibration was undertaken using a Type 1 acoustic calibrator, subject to independent annual calibration.

A.4.7 All sound level meters were field check calibrated before and after the survey at each location with no significant drift (+/- 0.5dB) in calibration recorded. The details of the calibrator used to check the sound level meters are presented in Table A.5.

Table A.5 Details of calibrator(s) used during noise surveys

Equipment	Manufacturer	Model	Serial number	Calibration date
Sound Calibrator	RION	NC-74	34936367	12 June 2018
Sound Calibrator	Castle	CA601	040405	19 June 2018

A.4.8 The details of the weather station used to monitor meteorological conditions during the three unattended survey locations are presented in Table A.6.

Table A.6 Details of weather transmitter used during unattended noise surveys

Equipment	Manufacturer	Type	Serial number	Calibration date
Weather Transmitter	VAISALA	WXT530	P1420147	28 Feb 2018

Equipment set up

A.4.9 In all cases, the sound level meters were installed and supported at a height of 1.2m to 1.5m above the ground, no closer than 3.5m to any significant reflecting surface (such as a building or fence), except the ground.

A.4.10 At all measurement locations, the presence of local noise sources, such as boiler flues, garden fountains, domestic drains, watercourses and farm

equipment, were identified. Such sources are variable (and may not be significant at other dwellings in the vicinity) and their effects were excluded by selection of measurement position.

A.4.11 The sound level monitors used at each location were set to record the following statistical parameters:

a. $L_{Aeq,T}$ – the A-weighted equivalent continuous sound level during the sample period (T) and effectively represents an average value.

b. L_{Amax} – the maximum A-weighted sound pressure level recorded

c. L_{A90} – the A-weighted sound level that is exceeded for 90% of the sample period; generally used to quantify background noise.

d. L_{A10} – the A-weighted sound level that is exceeded for 10% of the sample period; this parameter gives an indication of the upper limit of fluctuating noise, such as that from road traffic.

A.5 Noise survey results

Attended monitoring locations

A.5.1 The measured weekday ambient noise levels from the attended noise surveys are presented in Table A.7. A full set of the monitored data is available in Section A.6.

Table A.7 Monitored survey levels from attended noise survey locations

ID	Time base (T)	$L_{Aeq(T)}$	$L_{Amax(T)}$	$L_{A90(T)}$	$L_{A10(T)}$
A1	1-hour*	51.6 - 51.6	64.0 - 70.1	49.2 - 49.4	52.9 - 53.1
A2	1-hour*	42.6 - 46.1	57.8 - 66.1	36.2 - 40.6	45.7 - 48.6
A3	1-hour*	42.9 - 43.7	59.2 - 60.5	33.7 - 35.4	45.2 - 47.5
A4	3-hour	44.4	74.6	37.3	44.7
A5	3-hour	55.6	91.0	33.8	49.8
A7	1-hour*	50.5 - 52.6	66.0 - 69.6	41.7 - 47.3	54.0 - 56.2
A8	1-hour*	56.7 - 60.9	62.6 - 70.6	55.0 - 59.2	58.1 - 62.1
A9	1-hour*	44.5 - 53.0	56.3 - 74.5	40.6 - 51.1	47.4 - 54.1
A10	1-hour*	49.0 - 54.9	66.2 - 71.9	45.1 - 52.6	49.5 - 56.4
A11	1-hour*	47.9 - 53.4	58.7 - 66.5	42.9 - 50.7	48.6 - 55.2
A12	1-hour*	57.1 - 60.6	65.6 - 85.6	48.2 - 58.5	52.0 - 62.0
A13	1-hour*	53.2 - 56.7	75.8 - 81.0	43.9 - 50.8	53.9 - 55.9
A14	1-hour*	53.9 - 55.9	76.4 - 79.8	48.2 - 50.8	54.2 - 57.4
A15	1-hour*	69.5 - 71.9	88.7 - 91.4	64.5 - 68.6	68.5 - 71.5

ID	Time base (T)	$L_{Aeq(T)}$	$L_{Amax(T)}$	$L_{A90(T)}$	$L_{A10(T)}$
A16	1-hour*	46.6 - 48.6	59.3 - 67.0	39.5 - 44.7	47.6 - 52.0
Land 4	3-hour	41.6	62.2	31.9	44.4
Land 5	3-hour	42.6	60.2	36.0	45.1
Land 6	3-hour	53.4	65.6	51.7	54.5
** Measured range of 1-hour levels*					

Unattended monitoring locations

A.5.2 The measured weekday ambient noise levels from the unattended noise surveys are presented in Table A.8. A full set of the monitored data is available in Section A.7.

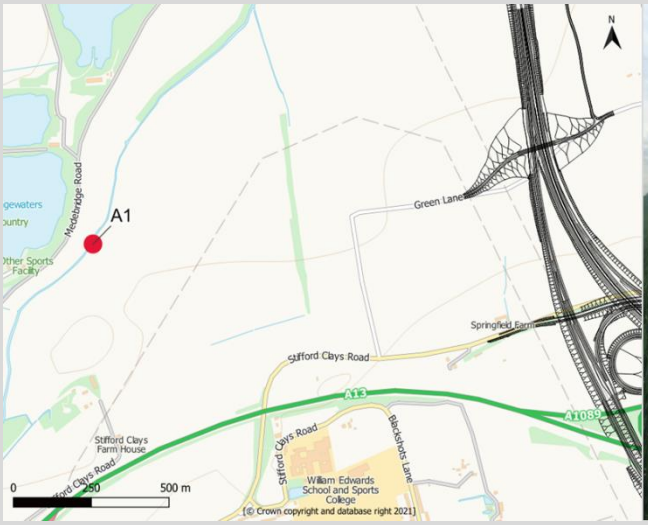
Table A.8 Monitored survey levels from unattended noise survey locations

ID	Time base (T)	$L_{Aeq(T)}$	$L_{Amax(T)}$	$L_{A90(T)}$	$L_{A10(T)}$
Land 1	12-hour (07:00 - 19:00)	50.0 - 55.9	67.9 - 72.2	42.7 - 52.9	49.2 - 56.5
Land 2	12-hour (07:00 - 19:00)	49.9 - 60.2	60.7 - 65.0	47.7 - 58.2	50.2 - 61.0
Inn on the Lake	12-hour (07:00 - 19:00)	70.0 - 71.8	80.5 - 83.6	67.1 - 69.6	71.5 - 73.1

A.6 Attended monitoring positions

Table A.9 Noise monitoring location A1

Location

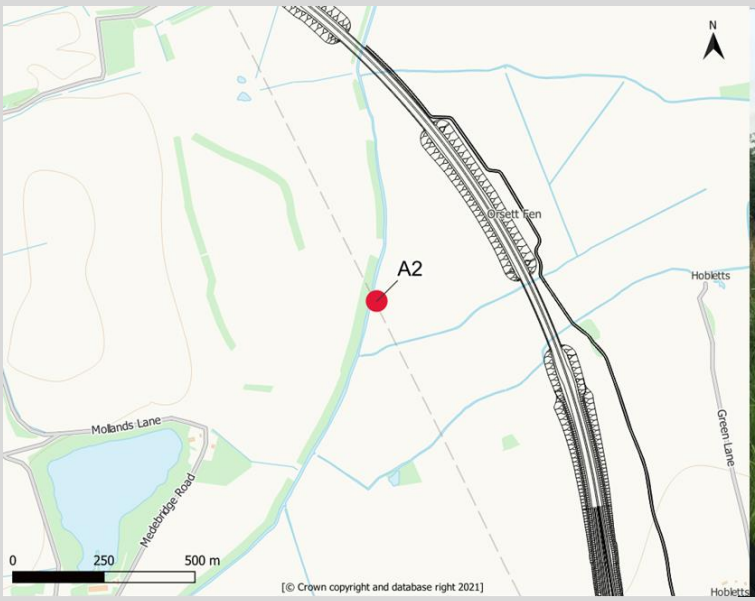


Primary noise sources: Distant background road traffic noise from A13. Road noise dominates noise environment at this location and time.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/06/2019 10:10	51.5	58.1	49.3	52.8
28/06/2019 10:25	51.3	64.0	49.4	52.4
28/06/2019 10:40	51.9	60.6	49.7	53.5
28/06/2019 10:55	51.8	59.4	49.1	53.6
Overall	51.6	64.0	49.4	53.1
28/06/2019 11:10	51.0	59.9	48.5	52.5
28/06/2019 11:25	51.7	70.1	49.5	52.4
28/06/2019 11:40	51.7	55.9	49.7	53.2
28/06/2019 11:55	51.8	60.5	49.3	53.3
Overall	51.6	70.1	49.2	52.9

Table A.10 Noise monitoring location A2

Location



Primary noise sources: Distant background road traffic noise from A13. Aircraft noise. Surveyor subjectively noted location to be tranquil. Buzzing noise from OHLs - barely perceivable. Bird noise.

Periods	15 minutes			
Sound Level Meter	FUSION_11036			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
22/05/2019 11:36	43.1	57.8	35.3	46.2
22/05/2019 11:51	41.3	52.4	35.9	44.1
22/05/2019 12:06	42.2	49.6	36.4	46.1
22/05/2019 12:21	43.6	51.8	38.2	46.1
Overall	42.6	57.8	36.2	45.7
22/05/2019 13:30	46.1	58.6	39.8	49.2
22/05/2019 13:45	45.6	56.6	40.2	48.1
22/05/2019 14:00	46.2	66.1	42.4	48.1
22/05/2019 14:15	46.5	58.6	41.3	49.2
Overall	46.1	66.1	40.6	48.6

Table A.11 Noise monitoring location A3

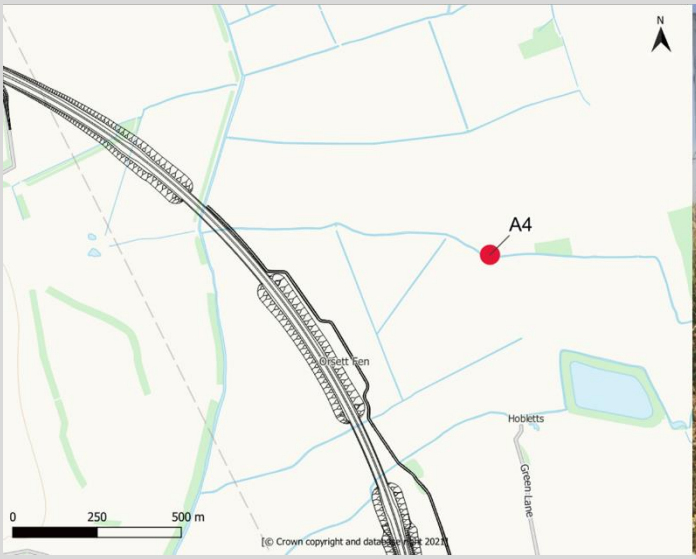
Location

Primary noise sources: No road noise of any description. Aircraft noise primary noise source and fairly loud at times. Surveyor subjectively noted location to be tranquil in countryside setting.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
22/05/2019 10:10	45.3	57.9	37.0	48.4
22/05/2019 10:25	45.6	59.2	35.4	49.3
22/05/2019 10:40	40.1	54.5	32.6	43.8
22/05/2019 10:55	41.5	53.1	33.5	44.9
Overall	43.7	59.2	33.7	47.5
22/05/2019 13:00	41.1	52.9	35.5	44.1
22/05/2019 13:15	44.9	60.5	35.5	46.9
22/05/2019 13:30	42.6	58.8	35.0	45.2
22/05/2019 13:45	42.1	56.2	36.3	44.3
Overall	42.9	60.5	35.4	45.2

Table A.12 Noise monitoring location A4

Location



Primary noise sources: Barely noticeable distant road traffic, distant noise from aircraft. General wildlife noise and noise from breezes through grasses in agricultural fields.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
17/07/2019 10:00	40.8	51.0	37.1	43.1
17/07/2019 10:15	41.2	51.1	37.8	43.5
17/07/2019 10:30	47.8	66.7	38.0	47.0
17/07/2019 10:45	40.7	53.7	36.2	42.9
17/07/2019 11:00	42.4	57.4	37.7	44.6
17/07/2019 11:15	41.5	51.2	37.4	44.2
17/07/2019 11:30	41.0	49.0	36.9	43.6
17/07/2019 11:45	40.9	49.1	37.2	43.6
17/07/2019 12:00	42.5	56.5	36.9	45.4
17/07/2019 12:15	47.6	64.7	38.8	47.0
17/07/2019 12:30	42.0	52.0	37.5	44.7
17/07/2019 12:45	49.1	74.6	38.7	46.3
Overall	44.4	74.6	37.3	44.7

Table A.13 Noise monitoring location A5

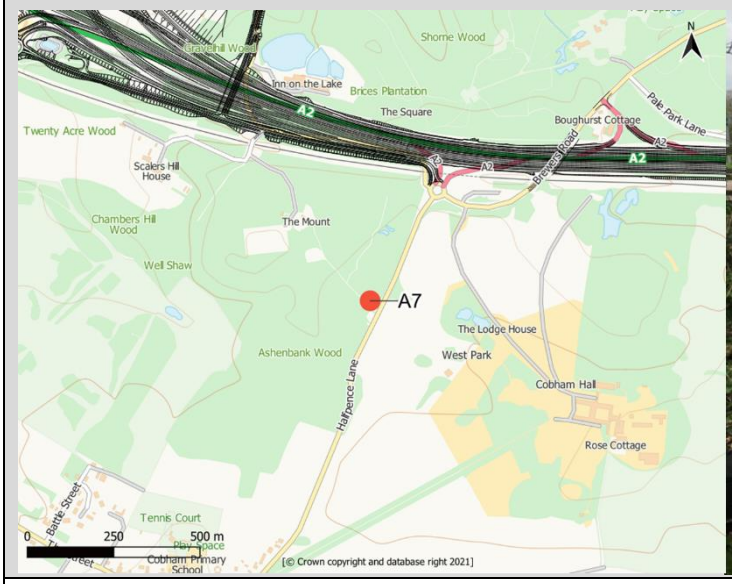
Location

Primary noise sources: Road traffic noise from Parkers Farm Road. No noticeable distant road traffic, distant noise from aircraft.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
16/07/2019 11:00	57.0	82.4	34.9	53.1
16/07/2019 11:15	50.8	69.2	35.0	49.7
16/07/2019 11:30	49.6	70.5	34.5	47.8
16/07/2019 11:45	42.2	56.4	33.2	46.0
16/07/2019 12:00	44.0	61.3	32.2	47.5
16/07/2019 12:15	50.0	67.7	33.8	51.0
16/07/2019 12:30	50.7	68.1	34.2	52.9
16/07/2019 12:45	47.0	65.7	32.6	48.5
16/07/2019 13:00	51.5	69.6	33.3	52.0
16/07/2019 13:15	50.9	74.7	34.2	48.5
16/07/2019 13:30	51.3	71.7	34.5	50.5
16/07/2019 13:45	64.7	91.0	34.0	52.1
Overall	55.6	91.0	33.8	49.8

Table A.14 Noise monitoring location A7

Location



Primary noise sources: Road traffic from Halfpence Lane. Distant road traffic from M2.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/03/2019 14:15	51.2	59.6	47.3	54.0
28/03/2019 14:30	53.2	67.8	46.4	55.6
28/03/2019 14:45	53.4	68.6	47.5	55.7
28/03/2019 15:00	52.2	60.8	48.0	55.1
Overall	52.6	68.6	47.3	55.2
01/05/2019 09:00	51.6	69.6	42.4	54.3
01/05/2019 09:15	50.6	59.5	41.6	54.7
01/05/2019 09:30	50.0	61.1	41.2	53.7
01/05/2019 09:45	49.5	62.9	42.3	52.8
Overall	50.5	69.6	41.7	54
10/05/2019 14:25	51.3	63.3	42.0	55.3
10/05/2019 14:40	53.0	60.9	44.5	56.4
10/05/2019 14:55	53.6	66.0	45.6	56.8
10/05/2019 15:10	52.3	63.4	42.7	56.2
Overall	52.6	66	43.1	56.2

Table A.15 Noise monitoring location A8

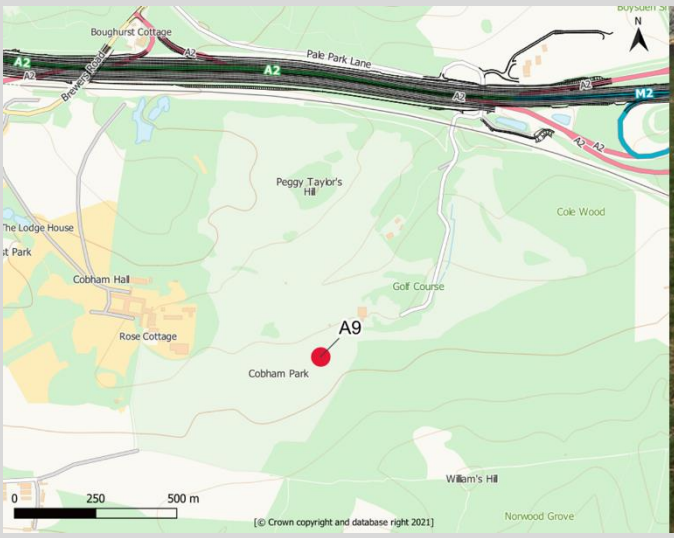
Location

Primary noise sources: Completely dominated by road traffic from M2. Directly adjacent to HS1.
Secondary noise sources: Aircraft over flight path.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
27/03/2019 13:45	60.2	68.7	58.7	61.0
27/03/2019 14:00	60.4	67.2	59.0	61.4
27/03/2019 14:15	60.9	63.0	59.7	61.7
27/03/2019 14:30	61.8	65.0	60.6	62.6
Overall	60.9	68.7	59.2	62.1
01/05/2019 10:30	58.1	65.4	56.1	59.2
01/05/2019 10:45	57.9	70.6	55.5	58.7
01/05/2019 11:00	57.2	62.7	55.5	58.4
01/05/2019 11:15	57.8	61.0	55.7	59.2
Overall	57.8	70.6	55.7	58.9
20/06/2019 15:45	57.8	62.6	56.5	58.8
20/06/2019 16:00	56.8	61.9	55.2	58.3
20/06/2019 16:15	56.1	58.7	55.1	56.9
20/06/2019 16:30	55.9	59.7	54.4	56.9
Overall	56.7	62.6	55.0	58.1

Table A.16 Noise monitoring location A9

Location

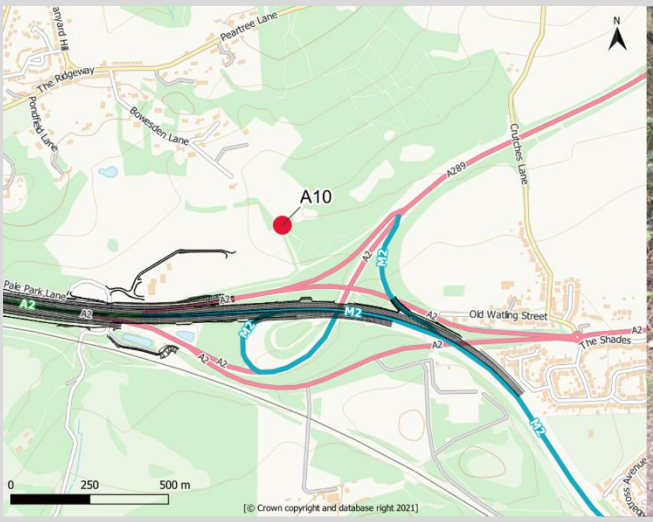


Primary noise sources: Distant traffic from M2. Activities associated with golf course, specifically grass mowing and maintaining putting green. Background road noise with no other noise sources ~ 41dBA.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
17/06/2019 09:50	46.6	58.3	43.4	47.9
17/06/2019 10:05	47.7	60.2	44.4	49.8
17/06/2019 10:20	49.9	61.8	43.5	53.1
17/06/2019 10:35	55.5	74.5	42.2	51.1
Overall	51.4	74.5	43.1	51.2
17/06/2019 10:50	44.7	56.3	41.5	47.1
17/06/2019 11:05	42.9	54.0	40.4	44.8
17/06/2019 11:20	43.6	55.7	40.3	45.5
17/06/2019 11:35	46.1	53.5	40.8	48.9
Overall	44.5	56.3	40.6	47.4
27/03/2019 15:25	52.7	66.3	50.8	52.9
27/03/2019 15:40	52.5	55.4	50.9	53.6
27/03/2019 15:55	53.5	60.1	51.4	54.8
27/03/2019 16:10	53.5	57.4	52.3	54.3
Overall	53.0	66.3	51.1	54.1

Table A.17 Noise monitoring location A10

Location



Primary noise sources: Distant traffic noise from M2 motorway.
Secondary noise sources: Bird song, aircraft.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
27/03/2019 10:30	49.5	63.9	45.4	51.0
27/03/2019 10:45	46.7	57.7	44.8	47.8
27/03/2019 11:00	50.2	68.1	45.0	50.9
27/03/2019 11:15	49.0	68.5	45.5	49.2
Overall	49.0	68.5	45.1	49.5
30/04/2019 12:15	55.4	60.0	53.6	56.8
30/04/2019 12:30	55.2	66.2	53.3	56.6
30/04/2019 12:45	55.0	60.9	53.0	56.4
30/04/2019 13:00	53.7	57.8	51.8	55.0
Overall	54.9	66.2	52.6	56.4
17/07/2019 15:00	53.0	57.7	50.9	54.7
17/07/2019 15:45	52.5	59.3	50.4	54.1
17/07/2019 16:00	54.2	71.9	50.8	54.2
17/07/2019 16:15	52.9	71.8	50.6	53.7
Overall	53.2	71.9	50.6	54.2

Table A.18 Noise monitoring location A11

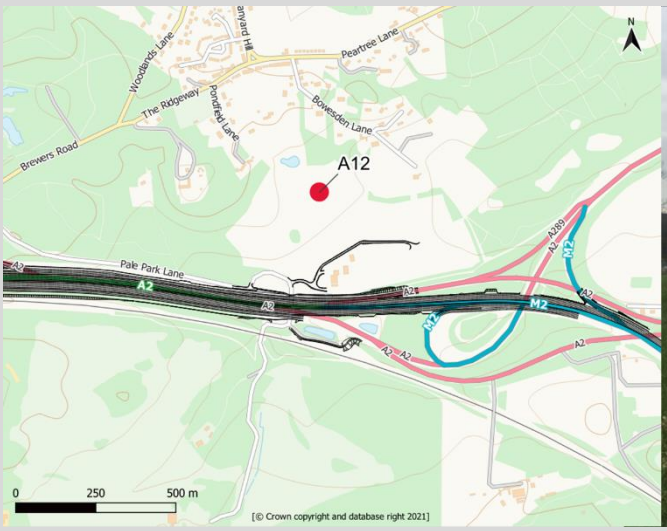
Location

Primary noise sources: Distant road traffic from M2.
Secondary noise sources: HS1, aircraft, dogs barking, bird song.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	Leq			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/03/2019 15:50	53.0	56.7	48.4	55.0
28/03/2019 16:05	54.3	57.9	52.3	55.7
28/03/2019 16:20	53.3	58.7	50.9	54.7
28/03/2019 16:35	52.7	58.6	50.4	54.9
Overall	53.4	58.7	50.0	55.2
30/04/2019 08:55	53.7	58.5	52.0	55.2
30/04/2019 09:10	53.2	61.4	51.1	54.7
30/04/2019 09:25	54.1	61.9	52.0	55.5
30/04/2019 09:40	51.8	60.0	49.7	53.1
Overall	53.3	61.9	50.7	55.0
10/05/2019 11:05	48.2	58.8	45.0	49.7
10/05/2019 11:20	45.0	59.6	42.3	46.6
10/05/2019 11:35	50.5	66.5	43.4	53.1
10/05/2019 11:50	45.2	53.1	43.4	46.7
Overall	47.9	66.5	42.9	48.6

Table A.19 Noise monitoring location A12

Location

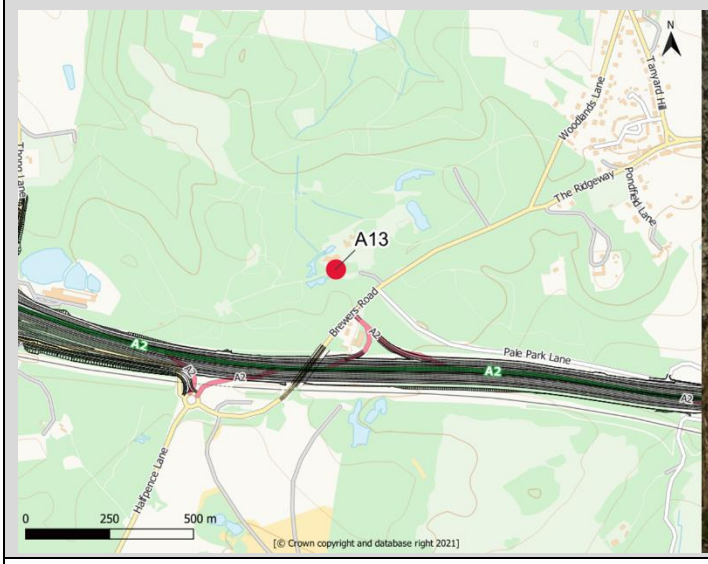


Primary noise sources: Road traffic from M2 motorway, distant noise from aircraft.
Secondary noise sources: Bird song, HS1 rail traffic noise, aircraft, dogs barking (12:55-13:00).

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
27/03/2019 09:05	51.9	62.5	49.7	52.7
27/03/2019 09:20	50.5	61.2	48.3	51.5
27/03/2019 09:35	62.4	85.6	48.1	52.1
27/03/2019 09:50	50.1	58.0	48.0	51.5
Overall	57.2	85.6	48.2	52.0
01/05/2019 12:05	51.1	62.0	47.6	53.4
01/05/2019 12:20	53.8	62.8	49.0	55.8
01/05/2019 12:35	55.7	65.7	53.6	56.7
01/05/2019 12:50	61.2	81.4	52.5	56.1
Overall	57.1	81.4	48.7	56.0
20/06/2019 14:16	59.5	62.8	57.1	61.0
20/06/2019 14:31	60.9	65.1	59.0	62.2
20/06/2019 14:46	61.1	64.1	59.3	62.3
20/06/2019 15:01	60.9	65.6	59.4	62.0
Overall	60.6	65.6	58.5	62.0

Table A.20 Noise monitoring location A13

Location



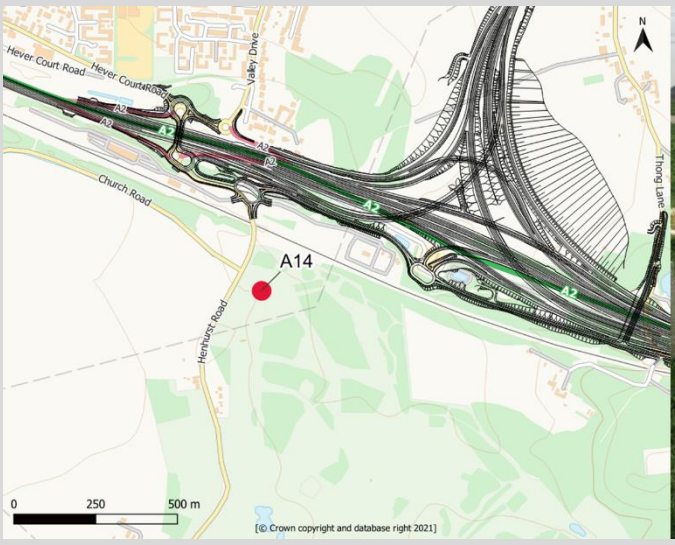
Primary noise sources: Background traffic from M2 (background approx. 50dBA when no other sources present).

Secondary noise sources: Country park maintenance vehicle drove past on occasions. Dog barking at times. Aircraft/Helicopter. Bird song.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/03/2019 11:05	48.5	65.2	43.9	50.8
28/03/2019 11:20	57.3	81.0	45.5	58.6
28/03/2019 11:35	51.4	76.7	43.8	49.3
28/03/2019 11:50	49.8	71.8	43.6	51.8
Overall	53.2	81.0	43.9	53.9
10/05/2019 09:25	56.0	71.5	51.7	56.8
10/05/2019 09:40	56.6	75.8	51.8	56.2
10/05/2019 09:55	54.0	69.1	50.5	54.5
10/05/2019 10:10	55.8	74.2	50.1	55.3
Overall	55.7	75.8	50.8	55.9
13/11/2019 13:23	54.0	70.9	49.4	55.2
13/11/2019 13:38	60.3	79.6	52.5	59.6
13/11/2019 13:53	55.2	69.7	51.5	55.8
13/11/2019 14:08	52.9	68.5	50.1	53.1
Overall	56.7	79.6	50.8	55.9

Table A.21 Noise monitoring location A14

Location



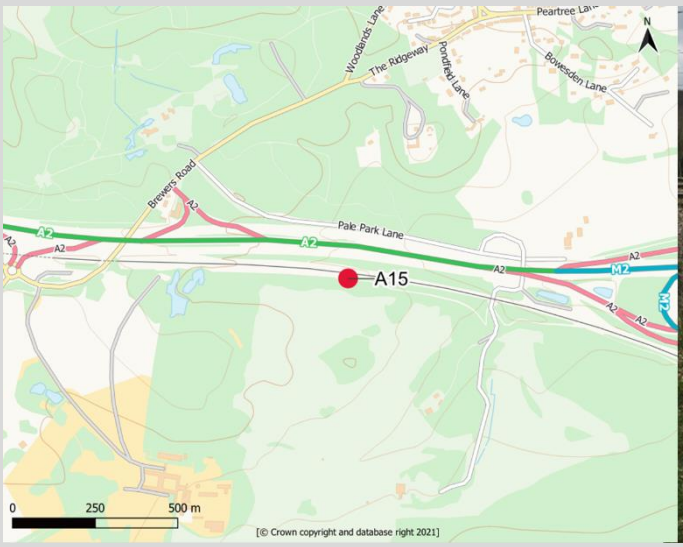
Primary noise sources: Background road traffic from M2.

Secondary noise sources: Noise from cars in car park. Dog barking at times. Aircraft. HS1. Road traffic noise from Henhurst Road.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/03/2019 09:05	56.3	79.5	49.0	55.3
28/03/2019 09:20	53.8	65.0	49.5	56.7
28/03/2019 09:35	51.2	62.9	48.5	53.3
28/03/2019 09:50	52.8	66.9	49.9	54.4
Overall	53.9	79.5	49.1	54.5
30/04/2019 13:45	56.7	76.4	52.8	57.7
30/04/2019 14:00	55.2	67.2	49.8	57.6
30/04/2019 14:15	55.6	65.0	52.2	57.1
30/04/2019 14:30	55.9	64.8	51.1	57.5
Overall	55.9	76.4	50.8	57.4
10/05/2019 13:05	58.9	79.8	48.0	55.0
10/05/2019 13:20	53.5	69.6	46.8	53.7
10/05/2019 13:35	52.8	63.5	50.5	54.4
10/05/2019 13:50	52.3	59.0	50.0	53.8
Overall	55.3	79.8	48.2	54.2

Table A.22 Noise monitoring location A15

Location

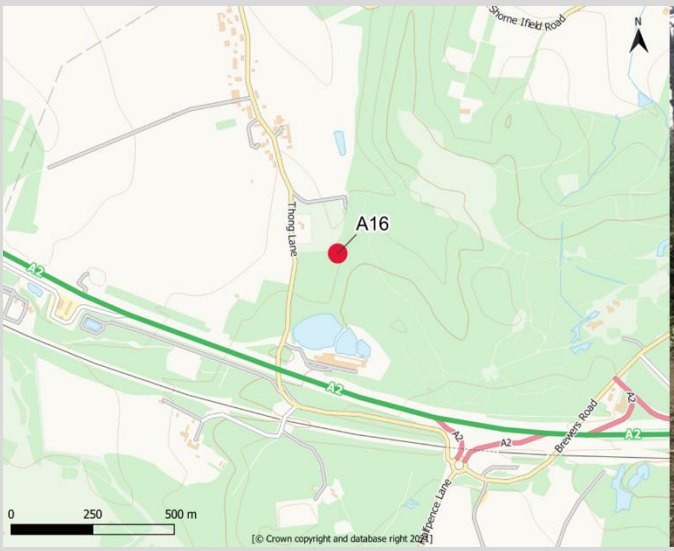


Primary noise sources: Completely dominated by road traffic from M2. Directly adjacent to HS1.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
27/03/2019 12:30	71.4	87.5	68.2	70.8
27/03/2019 12:45	71.1	87.2	68.5	71.7
27/03/2019 13:00	70.4	73.1	68.6	71.5
27/03/2019 13:15	73.0	91.4	69.2	71.6
Overall	71.6	91.4	68.6	71.5
30/04/2019 15:05	69.8	88.2	65.8	68.9
30/04/2019 15:20	68.0	83.2	65.8	68.6
30/04/2019 15:35	71.5	88.7	64.2	68.5
30/04/2019 15:50	67.8	87.4	63.7	67.9
Overall	69.5	88.7	64.5	68.5
09/05/2019 09:25	71.1	87.5	67.5	71.0
09/05/2019 09:40	73.3	90.5	67.4	71.3
09/05/2019 09:55	70.7	86.7	67.8	70.7
09/05/2019 10:10	72.2	91.3	68.5	71.1
Overall	71.9	91.3	67.8	71.0

Table A.23 Noise monitoring location A16

Location

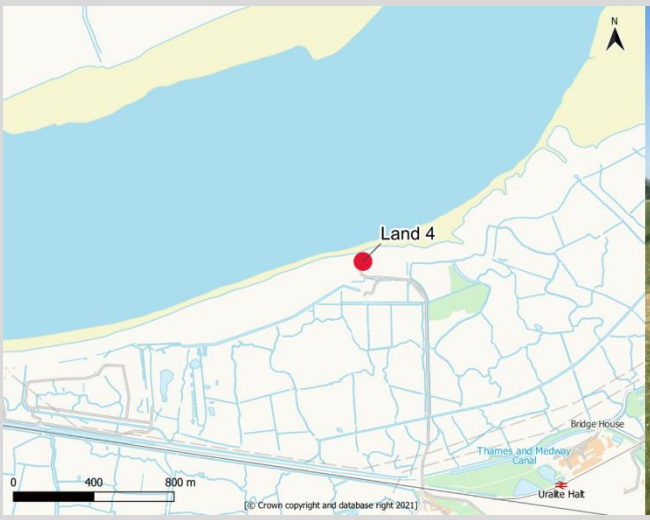


Primary noise sources: Background road traffic from M2 (just noticeable).
Secondary noise sources: Bird Song. Distant aircraft.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
28/03/2019 12:35	48.1	66.7	40.2	50.6
28/03/2019 12:50	46.8	65.7	40.7	49.4
28/03/2019 13:05	48.9	67.0	40.2	52.2
28/03/2019 13:20	49.9	63.4	41.0	53.5
Overall	48.6	67.0	40.5	52.0
30/04/2019 10:45	45.7	58.5	40.3	48.3
30/04/2019 11:00	47.8	62.5	39.2	48.4
30/04/2019 11:15	45.7	61.8	39.8	47.6
30/04/2019 11:30	46.7	59.9	38.8	49.7
Overall	46.6	62.5	39.5	48.6
11/08/2019 12:00	46.5	59.3	45.0	47.3
11/08/2019 12:15	47.6	56.8	45.4	49.4
11/08/2019 12:30	46.0	52.5	44.6	46.9
11/08/2019 12:45	46.2	59.1	44.1	47.4
Overall	46.6	59.3	44.7	47.6

Table A.24 Noise monitoring location Land 4

Location



Primary noise sources: Distant noise from river traffic, distant noise from aircraft. At some times aircraft noise fairly noticeable.

Periods	15 minutes			
Sound Level Meter	FUSION_11036			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
23/05/2019 11:20	44.8	62.2	38.5	46.1
23/05/2019 11:35	43.7	58.4	36.9	46.1
23/05/2019 11:50	42.0	53.8	36.5	44.5
23/05/2019 12:05	39.4	58.2	30.2	41.1
23/05/2019 12:20	40.2	56.2	29.8	43.4
23/05/2019 12:35	35.8	51.6	30.7	37.6
23/05/2019 12:50	42.5	61.0	32.1	44.1
23/05/2019 13:05	38.1	56.8	31.7	39.5
23/05/2019 13:20	41.9	56.1	32.8	45.2
23/05/2019 13:35	42.0	52.3	34.3	44.7
23/05/2019 13:50	40.1	51.7	33.6	43.4
23/05/2019 14:05	41.7	58.9	35.1	44.0
Overall	41.6	62.2	31.9	44.4

Table A.25 Noise monitoring location Land 5

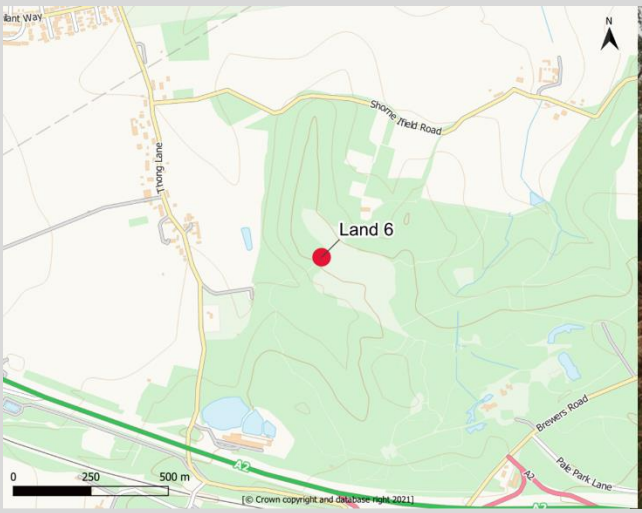
Location

Primary noise sources: Distant noise from river traffic, distant noise from aircraft.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
25/10/2018 11:15	42.4	53.9	38.3	44.3
25/10/2018 11:30	45.5	56.7	36.8	48.9
25/10/2018 11:45	43.3	59.8	36.2	46.0
25/10/2018 12:00	41.3	56.5	35.5	44.2
25/10/2018 12:15	42.7	58.7	38.2	43.0
25/10/2018 12:30	43.9	58.3	36.3	45.6
25/10/2018 12:45	36.6	42.8	33.8	38.3
25/10/2018 13:00	44.2	60.2	35.2	44.3
25/10/2018 13:15	40.0	46.6	35.6	42.9
25/10/2018 13:30	40.6	53.0	37.0	43.0
25/10/2018 13:45	43.1	56.8	38.0	45.7
25/10/2018 14:00	41.2	51.2	36.9	44.0
Overall	42.6	60.2	36.0	45.1

Table A.26 Noise monitoring location Land 6

Location



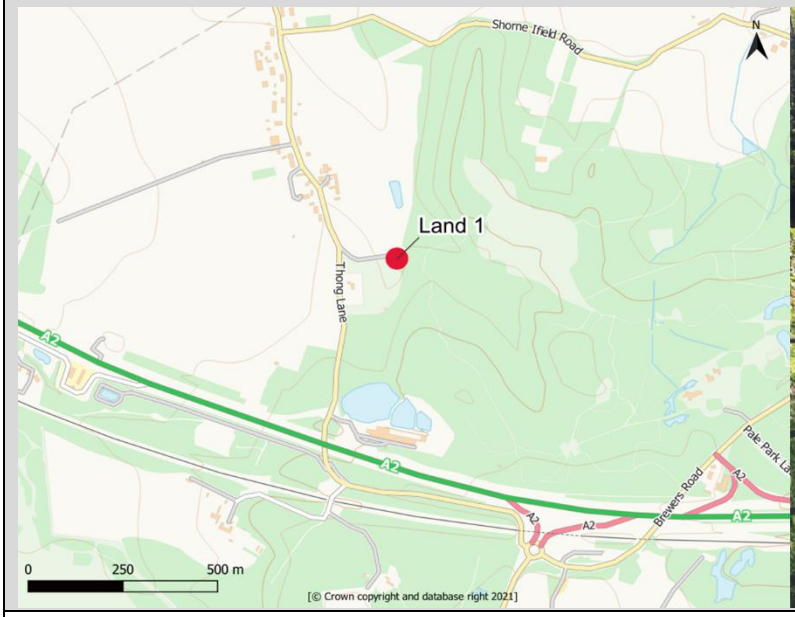
Primary noise sources: Distant traffic noise from M2/A2.
Secondary noise sources: Distant noise from aircraft and some bird noise.

Periods	15 minutes			
Sound Level Meter	FUSION_11035			
Weighting	A			
Data type	L_{eq}			
Unit	dB			
Period start	L_{eq}	L_{max}	L_{90}	L_{10}
15/11/2018 11:25	52.6	56.8	51.1	53.4
15/11/2018 11:40	54.2	60.8	52.5	55.1
15/11/2018 11:55	54.0	58.6	52.4	55.0
15/11/2018 12:10	53.4	56.9	52.1	54.2
15/11/2018 12:25	53.6	56.6	52.2	54.8
15/11/2018 12:40	53.2	56.5	51.5	54.4
15/11/2018 12:55	52.6	55.8	51.3	53.6
15/11/2018 13:10	52.7	55.2	51.5	53.5
15/11/2018 13:25	53.2	59.8	51.6	54.3
15/11/2018 13:40	53.3	56.7	52.0	54.2
15/11/2018 13:55	53.1	56.7	51.5	54.1
15/11/2018 14:10	54.6	65.6	52.8	55.4
Overall	53.4	65.6	51.7	54.5

A.7 Unattended monitoring positions

Table A.27 Noise monitoring location Land 1

Location



Primary noise sources: Distant noise from M2/A2 to the south of the monitoring location. Some noise from distant aircraft. Some road traffic noise from Thong Lane to the west.

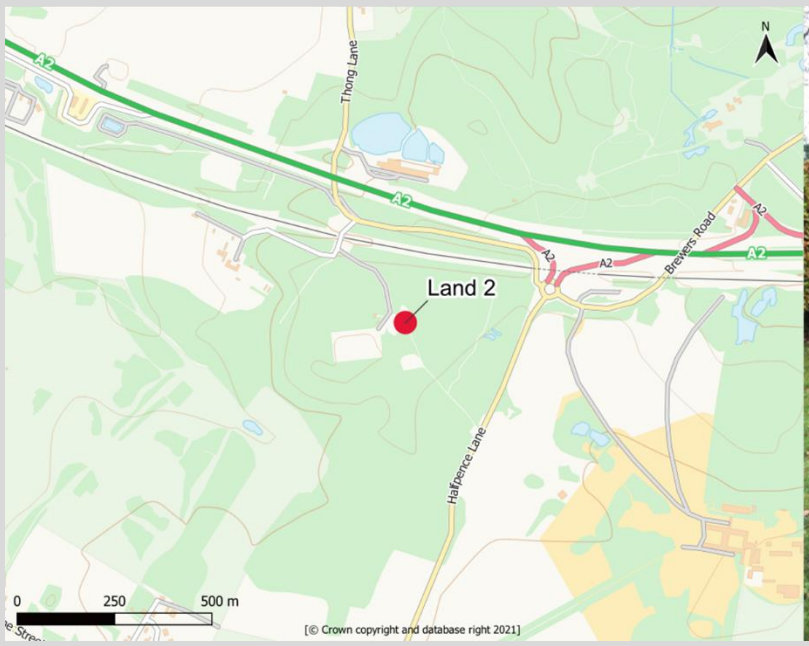
Periods	60 minutes					
Start	15/07/2019					
End	23/07/2019					
Sound Level Meter	FUSION_10696					
Weighting	A					
Data type	L_{eq}					
Unit	dB					
Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
16/07/2019 07:00	51.7	63.7	49.2	53.1	1	0
16/07/2019 08:00	49.9	60.9	47.8	51.3	0.9	0
16/07/2019 09:00	48.1	66.4	42.5	49.2	0.8	0
16/07/2019 10:00	50.8	72.7	41.3	49.6	0.9	0
16/07/2019 11:00	47.1	68.4	39.6	47.2	0.9	0
16/07/2019 12:00	55.0	80.1	39.2	48.8	0.9	0
16/07/2019 13:00	50.3	76.5	38.8	49.2	1.1	0
16/07/2019 14:00	46.8	68.9	40.0	46.6	0.9	0
16/07/2019 15:00	44.2	61.5	39.6	45.6	1.1	0
16/07/2019 16:00	46.1	64.5	42.6	48.5	1.2	0
16/07/2019 17:00	47.6	66.9	43.2	49.2	1.2	0

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
16/07/2019 18:00	50.9	65.0	48.3	52.4	1.4	0
Overall	50.0	68.0	42.7	49.2	-	-
17/07/2019 07:00	48.9	65.5	46.8	49.5	0.9	0
17/07/2019 08:00	49.5	64.8	47.2	50.9	1.2	0
17/07/2019 09:00	49.1	73.9	44.8	49.2	1.1	0
17/07/2019 10:00	49.2	61.4	46.7	50.6	1.4	0
17/07/2019 11:00	51.7	66.6	48.6	53.0	1.7	0
17/07/2019 12:00	52.2	70.4	48.4	53.3	1.6	0
17/07/2019 13:00	51.4	60.7	48.3	53.4	1.6	0
17/07/2019 14:00	52.6	75.7	49.8	53.9	1.5	0
17/07/2019 15:00	51.7	67.2	49.2	52.6	1.3	0
17/07/2019 16:00	52.4	76.1	47.8	50.8	1.2	0
17/07/2019 17:00	51.2	61.5	49.2	52.3	1.2	0
17/07/2019 18:00	53.1	71.5	49.9	53.8	1.1	0
Overall	51.3	67.9	48.1	51.9	-	-
18/07/2019 07:00	53.5	67.6	51.0	55.5	1.2	0
18/07/2019 08:00	54.4	70.9	52.2	55.7	1.2	0
18/07/2019 09:00	56.4	72.5	53.5	56.4	1.7	0
18/07/2019 10:00	54.8	69.3	52.4	56.0	1.4	0
18/07/2019 11:00	56.9	74.5	52.8	57.5	1.4	0.2
18/07/2019 12:00	55.4	77.8	50.4	55.4	0.9	0
18/07/2019 13:00	54.2	70.9	51.7	55.3	0.9	0
18/07/2019 14:00	58.7	77.3	53.7	59.1	1.4	0
18/07/2019 15:00	56.9	75.1	54.3	57.6	1.4	0
18/07/2019 16:00	56.1	72.2	52.8	56.8	1.4	0
18/07/2019 17:00	55.2	69.2	53.2	56.5	1.4	0
18/07/2019 18:00	55.0	68.9	52.8	56.2	1.4	0
Overall	55.9	72.2	52.6	56.5	-	-
19/07/2019 07:00	53.5	68.1	51.1	54.3	0.9	0.1
19/07/2019 08:00	52.4	69.6	48.9	53.4	0.8	0.1
19/07/2019 09:00	51.5	65.3	47.4	53.3	1.1	0
19/07/2019 10:00	55.0	74.0	49.8	55.0	1.2	0
19/07/2019 11:00	55.9	71.1	53.8	57.2	1.6	0.1
19/07/2019 12:00	55.9	68.5	53.8	57.4	1.3	0.2
19/07/2019 13:00	56.8	68.2	55.2	57.7	1.8	0.1
19/07/2019 14:00	56.4	68.2	54.5	57.5	2	0
19/07/2019 15:00	56.7	64.4	55.2	57.8	2.4	0
19/07/2019 16:00	57.5	77.7	54.8	58.1	1.8	0
19/07/2019 17:00	56.5	63.2	54.9	57.6	1.6	0
19/07/2019 18:00	57.0	68.2	55.0	58.1	1.8	0
Overall	55.8	68.9	52.9	56.5	-	-
20/07/2019 07:00	55.0	65.0	52.8	56.3	1.4	0
20/07/2019 08:00	-	-	-	-	1.1	1.8

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
20/07/2019 09:00	54.1	68.7	49.7	55.8	0.9	0.5
20/07/2019 10:00	57.2	64.7	55.2	58.5	1.6	0
20/07/2019 11:00	58.1	62.4	56.5	59.1	1.9	0
20/07/2019 12:00	58.2	69.9	56.1	59.6	2.1	0
20/07/2019 13:00	56.2	70.9	53.3	57.7	1.6	0
20/07/2019 14:00	57.2	63.3	55.5	58.4	1.9	0
20/07/2019 15:00	57.1	65.9	55.5	58.2	2	0
20/07/2019 16:00	56.9	67.7	54.9	58.0	1.8	0
20/07/2019 17:00	56.5	67.8	54.0	57.8	1.8	0
20/07/2019 18:00	56.8	68.4	55.0	58.0	1.8	0
Overall	56.8	66.8	54.4	57.9	-	-
21/07/2019 07:00	48.9	64.8	46.0	50.4	0.8	0
21/07/2019 08:00	48.7	70.1	44.0	49.7	0.9	0
21/07/2019 09:00	49.3	74.5	46.0	50.0	0.9	0
21/07/2019 10:00	53.9	77.1	48.9	53.6	1.1	0
21/07/2019 11:00	52.9	73.3	50.0	54.2	1.2	0
21/07/2019 12:00	54.6	69.6	52.6	55.9	1.4	0
21/07/2019 13:00	55.3	62.9	52.9	56.7	1.5	0
21/07/2019 14:00	54.8	66.2	50.5	56.6	1.4	0
21/07/2019 15:00	54.5	64.3	51.3	55.6	1.7	0
21/07/2019 16:00	54.7	65.3	52.2	56.0	1.5	0
21/07/2019 17:00	55.0	69.0	52.5	56.3	1.5	0
21/07/2019 18:00	54.7	68.9	51.8	56.0	1.5	0
Overall	53.7	68.8	49.9	54.3	-	-
22/07/2019 07:00	55.7	77.2	53.1	56.7	1.5	0
22/07/2019 08:00	56.5	74.8	54.8	57.5	1.8	0
22/07/2019 09:00	55.5	66.6	53.7	56.6	1.6	0
22/07/2019 10:00	56.0	76.5	53.6	56.7	1.5	0
22/07/2019 11:00	55.3	68.7	53.0	56.5	1.6	0
22/07/2019 12:00	54.8	67.6	52.7	56.0	1.5	0
22/07/2019 13:00	55.6	68.9	53.5	56.6	1.7	0
22/07/2019 14:00	54.6	66.2	52.1	55.5	1.8	0
22/07/2019 15:00	54.3	61.9	52.3	55.6	1.5	0
22/07/2019 16:00	53.8	62.6	51.6	55.1	1.6	0
22/07/2019 17:00	53.2	77.0	50.8	54.3	1.5	0
22/07/2019 18:00	52.7	69.9	50.4	53.9	1.4	0
Overall	55.0	69.8	52.6	55.9	-	-

Table A.28 Noise monitoring location Land 2

Location



Primary noise sources: Distant noise from M2/A2 to the north of the monitoring location. Although not noted on site, likely noise from HS1 at times.

Periods	60 minutes					
Start	13/11/2019					
End	20/11/2019					
Sound Level Meter	FUSION_10692					
Weighting	A					
Data type	L_{eq}					
Unit	dB					
Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
13/11/2019 07:00	51.9	57.6	50.4	52.9	1.1	0
13/11/2019 08:00	52.6	61.2	50.0	54.1	1.1	0
13/11/2019 09:00	52.0	70.1	49.7	52.5	1	0
13/11/2019 10:00	50.0	57.4	48.1	51.1	0.9	0
13/11/2019 11:00	50.7	71.7	47.1	51.1	0.7	0
13/11/2019 12:00	48.1	62.8	45.7	48.9	0.8	0
13/11/2019 13:00	46.6	57.5	44.9	47.5	1.1	0
13/11/2019 14:00	49.9	73.3	45.8	48.6	1	0
13/11/2019 15:00	48.1	63.8	45.7	48.4	1.3	0
13/11/2019 16:00	49.2	60.0	47.6	49.9	1.1	0
13/11/2019 17:00	51.4	60.6	49.3	52.6	1.2	0

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
13/11/2019 18:00	52.4	60.8	50.9	53.3	1	0
Overall	50.6	63.1	47.9	50.9	-	-
14/11/2019 07:00	47.6	57.8	45.4	49.0	1.2	0
14/11/2019 08:00	50.1	61.6	47.9	51.3	1.1	0
14/11/2019 09:00	50.9	60.9	49.7	51.7	0.9	0
14/11/2019 10:00	51.3	65.0	49.4	52.5	0.9	0
14/11/2019 11:00	49.7	61.1	47.5	51.4	1.6	0
14/11/2019 12:00	48.8	59.1	46.8	49.8	1.4	0
14/11/2019 13:00	50.7	68.9	48.0	51.0	1.2	0
14/11/2019 14:00	51.9	59.2	50.1	53.3	0.5	0
14/11/2019 15:00	54.7	60.5	53.1	55.8	0.4	0
14/11/2019 16:00	55.8	64.7	54.4	56.7	0.7	0
14/11/2019 17:00	53.6	59.8	50.6	56.0	0.5	0.1
14/11/2019 18:00	54.7	62.3	52.4	56.0	0.6	0
Overall	52.3	61.7	49.6	52.9	-	-
15/11/2019 07:00	56.4	62.4	55.0	57.5	0.7	0
15/11/2019 08:00	57.8	61.3	56.6	58.7	0.8	0
15/11/2019 09:00	57.3	61.6	56.1	58.2	0.8	0
15/11/2019 10:00	59.1	64.0	56.6	60.9	1.3	0
15/11/2019 11:00	60.5	66.1	58.8	61.7	1.8	0
15/11/2019 12:00	61.1	68.1	59.6	62.3	2.2	0
15/11/2019 13:00	61.7	64.9	60.1	62.8	2.3	0
15/11/2019 14:00	61.4	66.9	60.0	62.5	2.4	0.1
15/11/2019 15:00	61.7	69.0	60.3	62.9	2.2	0.2
15/11/2019 16:00	60.8	64.1	59.4	61.8	2.1	0.5
15/11/2019 17:00	-	-	-	-	1.8	1.5
15/11/2019 18:00	60.3	66.4	57.4	61.8	2	0
Overall	60.2	65.0	58.2	61.0	-	-
16/11/2019 07:00	51.9	61.3	49.1	53.7	0.5	0
16/11/2019 08:00	51.2	60.3	48.7	52.2	0.8	0
16/11/2019 09:00	52.0	58.1	48.6	53.4	0.6	0
16/11/2019 10:00	49.5	61.2	46.4	51.4	0.7	0
16/11/2019 11:00	49.1	59.4	47.3	50.1	0.4	0
16/11/2019 12:00	49.2	62.4	47.4	50.3	0.3	0
16/11/2019 13:00	50.0	55.9	47.6	51.5	0.3	0
16/11/2019 14:00	49.8	61.1	47.6	51.1	0.2	0
16/11/2019 15:00	50.9	58.4	49.5	51.7	0.2	0
16/11/2019 16:00	52.5	60.5	50.7	53.6	0.2	0
16/11/2019 17:00	52.8	57.7	49.7	54.2	0.3	0
16/11/2019 18:00	50.0	58.5	48.1	50.9	0.2	0
Overall	50.9	59.6	48.4	52.0	-	-
17/11/2019 07:00	51.6	56.5	49.1	53.1	0.3	0
17/11/2019 08:00	51.5	62.4	49.9	52.7	0.5	0

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
17/11/2019 09:00	51.1	73.6	49.6	51.7	0.5	0
17/11/2019 10:00	50.7	57.2	49.3	51.6	0.7	0
17/11/2019 11:00	51.7	65.8	50.0	52.4	0.9	0
17/11/2019 12:00	52.1	58.6	50.7	53.0	0.9	0
17/11/2019 13:00	52.4	61.9	51.1	53.1	0.8	0
17/11/2019 14:00	52.2	61.7	50.6	53.2	1	0
17/11/2019 15:00	53.2	60.5	51.2	54.6	0.6	0
17/11/2019 16:00	55.8	69.1	54.4	56.5	0.4	0
17/11/2019 17:00	56.4	65.7	55.1	57.1	0.4	0
17/11/2019 18:00	55.2	59.9	53.6	56.4	0.3	0
Overall	53.0	62.7	51.2	53.8	-	-
18/11/2019 07:00	57.6	65.3	55.4	59.0	1.1	0
18/11/2019 08:00	58.9	63.1	57.4	60.0	1	0
18/11/2019 09:00	58.9	63.0	57.2	60.1	1	0
18/11/2019 10:00	58.5	64.0	57.0	59.7	1.2	0
18/11/2019 11:00	58.0	62.6	56.3	59.1	1.1	0
18/11/2019 12:00	57.7	61.9	56.1	58.9	1.1	0
18/11/2019 13:00	58.3	62.7	56.7	59.5	1.1	0
18/11/2019 14:00	58.8	63.0	57.0	60.1	1.1	0
18/11/2019 15:00	58.3	62.9	56.6	59.5	0.7	0
18/11/2019 16:00	58.6	69.7	57.0	59.6	0.6	0
18/11/2019 17:00	56.7	60.6	55.3	58.1	0.6	0
18/11/2019 18:00	56.1	60.8	54.9	56.9	0.4	0
Overall	58.1	63.3	56.4	59.2	-	-
19/11/2019 07:00	50.9	57.5	49.3	51.9	0.5	0
19/11/2019 08:00	50.6	58.5	48.4	51.9	0.6	0
19/11/2019 09:00	50.4	63.2	48.3	51.4	0.7	0
19/11/2019 10:00	47.2	60.4	45.3	48.1	1	0
19/11/2019 11:00	46.5	60.7	44.3	47.1	1	0
19/11/2019 12:00	46.4	57.6	45.1	47.1	0.9	0
19/11/2019 13:00	47.4	66.1	44.9	47.3	1.2	0
19/11/2019 14:00	47.7	57.6	46.4	48.4	1.1	0
19/11/2019 15:00	50.3	66.0	47.8	50.8	1.1	0
19/11/2019 16:00	51.1	59.4	50.0	51.9	1.4	0
19/11/2019 17:00	53.0	63.8	51.8	53.5	1.4	0
19/11/2019 18:00	51.6	57.0	50.5	52.5	1.6	0
Overall	49.9	60.7	47.7	50.2		

Table A.29 Noise monitoring location Inn on the Lake

Location

Primary noise sources: Surveyor deemed location to be extremely noisy as directly adjacent to the A2. Potential noise from delivery trolleys movements below, however noise environment completely dominated by road traffic noise.

Periods	60 minutes					
Start	15/07/2019					
End	23/07/2019					
Sound Level Meter	FUSION_11893					
Weighting	A					
Data type	L_{eq}					
Unit	dB					
Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
16/07/2019 07:00	70.2	75.0	67.4	71.9	1	0
16/07/2019 08:00	70.6	82.7	68.1	72.2	0.9	0
16/07/2019 09:00	69.8	84.1	67.1	71.4	0.8	0
16/07/2019 10:00	69.4	77.1	66.5	71.2	0.9	0
16/07/2019 11:00	67.6	81.8	63.2	70.0	0.9	0
16/07/2019 12:00	69.6	82.0	66.8	71.2	0.9	0
16/07/2019 13:00	69.8	78.5	66.7	71.6	1.1	0
16/07/2019 14:00	69.5	79.5	65.9	71.3	0.9	0
16/07/2019 15:00	70.3	85.1	68.1	71.5	1.1	0
16/07/2019 16:00	70.6	82.9	68.8	71.7	1.2	0
16/07/2019 17:00	70.0	85.2	67.0	71.3	1.2	0

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
16/07/2019 18:00	71.7	82.3	69.8	72.8	1.4	0
Overall	70.0	81.4	67.1	71.5	-	-
17/07/2019 07:00	69.9	74.8	67.3	71.4	0.9	0
17/07/2019 08:00	69.8	78.8	64.9	71.8	1.2	0
17/07/2019 09:00	67.6	75.7	62.7	70.5	1.1	0
17/07/2019 10:00	69.4	80.1	66.7	71.0	1.4	0
17/07/2019 11:00	69.9	80.0	67.0	71.6	1.7	0
17/07/2019 12:00	70.1	85.8	66.9	71.3	1.6	0
17/07/2019 13:00	70.0	85.4	67.1	71.4	1.6	0
17/07/2019 14:00	70.4	79.2	67.9	71.9	1.5	0
17/07/2019 15:00	71.0	82.7	68.9	72.1	1.3	0
17/07/2019 16:00	71.2	89.8	69.1	72.2	1.2	0
17/07/2019 17:00	71.4	81.8	69.9	72.3	1.2	0
17/07/2019 18:00	71.2	78.4	69.2	72.4	1.1	0
Overall	70.3	81.0	67.3	71.7	-	-
18/07/2019 07:00	71.3	85.8	68.8	72.4	1.2	0
18/07/2019 08:00	71.3	89.3	69.0	72.4	1.2	0
18/07/2019 09:00	70.7	85.3	68.2	71.9	1.7	0
18/07/2019 10:00	71.0	87.4	68.0	72.0	1.4	0
18/07/2019 11:00	70.9	79.3	68.3	72.7	1.4	0.2
18/07/2019 12:00	71.2	80.2	68.8	72.8	0.9	0
18/07/2019 13:00	71.3	77.9	69.0	72.8	0.9	0
18/07/2019 14:00	72.1	79.4	69.8	73.4	1.4	0
18/07/2019 15:00	72.2	86.6	70.1	73.3	1.4	0
18/07/2019 16:00	72.1	83.9	70.3	73.1	1.4	0
18/07/2019 17:00	71.8	83.2	70.0	72.9	1.4	0
18/07/2019 18:00	72.1	84.6	70.0	73.2	1.4	0
Overall	71.5	83.6	69.2	72.7	-	-
19/07/2019 07:00	71.6	75.7	69.4	73.0	0.9	0.1
19/07/2019 08:00	72.0	92.9	69.2	72.9	0.8	0.1
19/07/2019 09:00	70.6	75.9	68.1	72.1	1.1	0
19/07/2019 10:00	70.5	79.0	68.2	72.1	1.2	0
19/07/2019 11:00	71.2	81.2	68.5	72.8	1.6	0.1
19/07/2019 12:00	72.0	80.0	69.7	73.5	1.3	0.2
19/07/2019 13:00	72.3	76.7	70.1	73.6	1.8	0.1
19/07/2019 14:00	72.3	77.6	70.3	73.5	2	0
19/07/2019 15:00	72.2	80.0	70.2	73.5	2.4	0
19/07/2019 16:00	72.4	85.4	70.5	73.4	1.8	0
19/07/2019 17:00	72.0	78.6	70.4	73.1	1.6	0
19/07/2019 18:00	72.3	82.6	70.5	73.5	1.8	0
Overall	71.8	80.5	69.6	73.1	-	-
20/07/2019 07:00	70.2	76.1	67.3	72.1	1.4	0
20/07/2019 08:00					1.1	1.8

Period start	L_{eq}	L_{max}	L_{90}	L_{10}	Wind Speed m/s	Rain Fall mm
20/07/2019 09:00	71.8	80.3	68.6	73.7	0.9	0.5
20/07/2019 10:00	71.7	76.5	69.3	73.2	1.6	0
20/07/2019 11:00	71.8	80.0	69.6	73.2	1.9	0
20/07/2019 12:00	72.4	90.1	70.3	73.5	2.1	0
20/07/2019 13:00	72.2	79.9	69.7	73.7	1.6	0
20/07/2019 14:00	71.7	79.3	69.3	73.2	1.9	0
20/07/2019 15:00	71.5	84.8	69.0	72.8	2	0
20/07/2019 16:00	71.5	81.6	69.0	72.9	1.8	0
20/07/2019 17:00	72.1	82.0	69.4	73.6	1.8	0
20/07/2019 18:00	71.9	77.3	69.4	73.4	1.8	0
Overall	71.7	80.7	69.2	73.2	-	-
21/07/2019 07:00	67.1	87.8	62.2	69.4	0.8	0
21/07/2019 08:00	67.5	81.1	63.4	69.6	0.9	0
21/07/2019 09:00	69.0	81.7	65.6	70.8	0.9	0
21/07/2019 10:00	70.4	86.0	67.5	72.0	1.1	0
21/07/2019 11:00	70.6	78.5	68.0	72.2	1.2	0
21/07/2019 12:00	71.0	81.7	68.6	72.5	1.4	0
21/07/2019 13:00	70.9	83.4	68.3	72.3	1.5	0
21/07/2019 14:00	70.2	78.4	67.5	71.9	1.4	0
21/07/2019 15:00	70.3	80.9	67.4	72.1	1.7	0
21/07/2019 16:00	70.8	85.1	68.0	72.4	1.5	0
21/07/2019 17:00	70.9	80.7	68.2	72.5	1.5	0
21/07/2019 18:00	70.5	80.5	67.6	72.2	1.5	0
Overall	70.1	82.2	66.9	71.7	-	-
22/07/2019 07:00	70.1	86.3	67.0	71.7	1.5	0
22/07/2019 08:00	71.0	80.7	68.9	72.4	1.8	0
22/07/2019 09:00	70.6	85.2	68.4	72.1	1.6	0
22/07/2019 10:00	71.0	86.5	68.7	72.3	1.5	0
22/07/2019 11:00	71.2	83.4	68.6	72.6	1.6	0
22/07/2019 12:00	70.7	82.5	68.4	72.0	1.5	0
22/07/2019 13:00	70.9	76.8	68.5	72.3	1.7	0
22/07/2019 14:00	70.9	77.4	68.4	72.3	1.8	0
22/07/2019 15:00	71.3	84.7	69.2	72.5	1.5	0
22/07/2019 16:00	71.2	79.8	69.5	72.3	1.6	0
22/07/2019 17:00	71.1	78.4	69.5	72.2	1.5	0
22/07/2019 18:00	71.1	77.3	69.0	72.5	1.4	0
Overall	70.9	81.6	68.7	72.3	-	-

Annex B Environmental Lighting Zones within LLCAs

B.1.1 Table B.1 lists the range of Environmental Lighting Zones set out in the Guidance Notes for The Reduction of Obtrusive Light, Guidance Note 01/21 (Institution of Lighting Professionals, 2021), on which the definition of the Environmental Lighting Zones for each LLCA shown in Figure 7.3 (Application Document 6.2) has been based. Environmental Lighting Zones have been identified using professional judgement and site appraisal.

Table B.1 Environmental Lighting Zones (Table 1 from Guidance Notes for the Reduction of Obtrusive Light, Guidance Note 01/21)

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark	United Nations Educational, Scientific and Cultural Organisation (UNESCO) Starlight Reserves, International Dark-Sky Association 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

B.1.2 Table B.2 sets out the Environmental Lighting Zones defined within the study area by reference to LLCAs and provides an estimated percentage split for each zone in accordance with Guidance Notes for the Reduction of Obtrusive Light, Guidance Note 01/21 (Institution of Lighting Professionals, 2021).

Table B.2 Environmental .05Lighting Zones by LLCA

Receptor (LLCA)	Environmental Lighting Zone (estimated percentage split across the LLCA)					Lighting sources
	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4	
Kent Downs AONB						
West Kent Downs (sub area Cobham)	N/a	90%	10%	N/a	N/a	From the northern edge of the LLCA, light sources along the A2 are prominent, crossing the predominately intrinsically dark landscape. The skyglow from these and further light sources within Gravesend are notable in northerly views.

Receptor (LLCA)	Environmental Lighting Zone (estimated percentage split across the LLCA)					Lighting sources
	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4	
West Kent Downs (sub area Shorne)	N/a	80%	20%	N/a	N/a	From the southern and western edge of the LLCA, filtered views of light sources along the A2 are prominent, including the edge of Gravesend, with features to the north-west visible within the Thames Estuary resulting in a degree of skyglow in westerly views from within the woodland.
The setting of the Kent Downs AONB and Green Belt						
Higham Arable Farmlands (sub area Gadshill)	N/a	N/a	90%	10%	N/a	Light sources in the night-time environment are notable along the A2 corridor. These are set against the backdrop of the Kent Downs AONB, which is an intrinsically dark landscape.
Shorne Wooded Slopes	N/a	50%	40%	10%	N/a	Light sources in the night-time environment are notable along the A2 corridor, set against the backdrop of the AONB's intrinsically dark landscape.
Higham Arable Farmland (Thong)	N/a	2%	90%	8%	N/a	To the south and south-east, light sources along the A2 are prominent, set against the intrinsically dark landscape of the AONB. To the north-west and west, the skyglow from light sources within Gravesend are notable.
Istead Arable Farmlands	N/a	5%	80%	15%	N/a	Notable light sources in the night-time environment are visible along the A2 corridor to the north-east and there is skyglow associated with Gravesend to the north, which is visible from this area of low-level brightness. To the east and south-east, the AONB is seen as an intrinsically dark landscape.
Gravesend Southern Fringe	N/a	N/a	70%	30%	N/a	The A2 corridor and urban edge of Gravesend are notable light sources in the night-time environment. Lighting is particularly prominent at the A2/Wrotham Road and Gravesend East junctions.
Higham Arable Farmlands (sub area Chalk)	N/a	N/a	95%	5%	N/a	The northern edge of the AONB is intrinsically dark in nature. This is offset by light sources in Gravesend, which are visible from the east of this LLCA, and distant light sources, which are visible to the north of the River Thames, including the prominent London Gateway Port and Tilbury Docks.

Receptor (LLCA)	Environmental Lighting Zone (estimated percentage split across the LLCA)					Lighting sources
	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4	
Shorne and Higham Marshes	N/a	N/a	100%	N/a	N/a	The northern edge of the AONB is intrinsically dark in nature. This is offset by light sources in Gravesend, which are visible to the west, and distant light sources, which are visible to the north of the River Thames, including the prominent London Gateway Port and Tilbury Docks.
Mucking Marshes	N/a	N/a	85%	15%	N/a	This is typically a low-level district brightness area, with limited light sources in the immediate views, although East Tilbury has a greater light level. Views east are influenced by the prominent light sources at the London Gateway Port with an effect on skyglow, and views west containing further skyglow from the urban areas of Tilbury and Chadwell St Mary. Views south are noticeably void of light sources, reflective of the AONB's intrinsically dark landscape.
Tilbury Marshes	N/a	N/a	80%	15%	5%	The immediate views from the Tilbury Marshes include the Chadwell escarpment, which has a low level of brightness. Views south are influenced by prominent light sources at Tilbury Docks, which cause skyglow within this area, together with views south-west to Gravesend.
Chadwell Escarpment Urban Fringe	N/a	N/a	95%	5%	N/a	This is a low-level district brightness area with limited light sources in the immediate views. Views south-west towards Tilbury are influenced by skyglow from the urban settlement, industrial areas and Tilbury Docks.
Green Belt/areas beyond setting of the Kent Downs AONB						
Dartford and Gravesend Fringe	N/a	N/a	55%	45%	N/a	Light sources in the night-time environment are dominant along the A2 corridor along with the surrounding urban area of Gravesend.
West Tilbury Urban Fringe	N/a	N/a	85%	15%	N/a	This is typically a low-level district brightness area with limited light sources in the immediate views. Views east are influenced by the prominent light sources at the London Gateway Port, and views west are influenced by the skyglow resulting from the urban areas of Tilbury and Chadwell St Mary. Views south are

Receptor (LLCA)	Environmental Lighting Zone (estimated percentage split across the LLCA)					Lighting sources
	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4	
						noticeably void of light sources, reflective of the AONB's intrinsically dark landscape.
Linford/ Buckingham Hill Urban Fringe	N/a	N/a	90%	10%	N/a	This is typically a low-level district brightness area with limited light sources in the immediate views, although Linford has a greater light level. Views east are influenced by the prominent light sources at the London Gateway Port with an effect on skyglow, and views west contain further skyglow from the urban areas of Tilbury and Chadwell St Mary.
White Croft/ Orsett Heath Urban Fringe	N/a	N/a	85%	15%	N/a	This is typically a low-level district brightness area with light sources within the adjacent settlements/residential areas influencing the immediate environs. As a result of the urban edge nature of this landscape, there is a consistent degree of skyglow in the majority of views.
Orsett Lowland Farmland	N/a	N/a	85%	15%	N/a	This is typically an area of low district brightness, with areas of medium district brightness at the residential urban areas. Light sources are a feature of views into the adjacent LLCAs, including lighting along the A13 and A1089.
Thurrock Reclaimed Fen (sub area Mardyke	N/a	20%	75%	5%	N/a	This is typically an area of low district brightness, with areas of intrinsic darkness in the core low-lying area. Light sources within Chadwell St Mary and Chafford Hundred are notable and visible on the skyline in views to the south.
Thurrock Reclaimed Fen (sub area Thames Chase)	N/a	N/a	98%	2%	N/a	This is typically an area of low district brightness but influenced by the surrounding urban areas of Horndon-on-the-Hill and the M25.
Belhus Lowland Quarry Farmland	N/a	N/a	75%	25%	N/a	This is typically an area of low district brightness, with areas of medium district brightness in the residential urban areas. Light sources are a feature of views, including those along North Road/Clay Tye Road, and the M25.

Receptor (LLCA)	Environmental Lighting Zone (estimated percentage split across the LLCA)					Lighting sources
	Zone E0	Zone E1	Zone E2	Zone E3	Zone E4	
Brentwood Wooded Hills	N/a	N/a	95%	5%	N/a	This is typically an area of low district brightness, with light sources a feature of views, including those on the M25.

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