Integrated Impact Assessment for Thurrock Local Plan

Scoping Report

Thurrock Council

Final report

Prepared by LUC

June 2022

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1	Draft report	R Myerscough M Andrew H Ennis S Smith M Mc Ginley	J Pearson	J Pearson	27/04/2021
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Air, land and water quality

Policy context

International

5.1 The **2030 Agenda for Sustainable Development** (2015) **[See reference 192]**: This initiative, adopted by all United Nations Member States, provides a shared blueprint for peace and prosperity for people and the planet and includes 17 Sustainable Development Goals (SDGs), designed to achieve a better and more sustainable future for all. Relevant to this topic are:

- SDG 6: Clean Water and Sanitation
- SDG 14: Life Below Water
- SDG 15: Life on Land

National

5.2 The **NPPF** (2021) **[See reference 193]** states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued soil and the economic and other benefits of the best and most versatile agricultural land. Policies should also prevent new and existing development from "contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution".

5.3 The document also requires that strategic policies should seek to make the most effective use of land in meeting local requirements making as much use

as possible of previously developed or 'brownfield' land. Furthermore, policies should "support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land".

5.4 The NPPF is supported by planning practice guidance relating to:

- **Air quality** (2019) **[See reference 194]** – Provides guidance on air quality considerations planning needs to take into account.
- **Effective use of land** (2019) **[See reference 195]** – Provides guidance on making effective use of land, including planning for higher density development.
- **Green Belt** (2019) **[See reference 196]** – Provides advice on the role of the Green Belt in the planning system, removal of land from the Green Belt and compensatory improvements.
- **Land affected by contamination** (2019) **[See reference 197]** – Outlines guiding principles on how planning can deal with land affected by contamination.
- **Land stability** (2019) **[See reference 198]** – Sets out advice on how to ensure that development is suitable to its ground condition and how to avoid risks caused by unstable land or subsidence.
- **Natural environment** (2019) **[See reference 199]** – Highlights key issues in implementing policy to protect and enhance the natural environment, agricultural land, soils and brownfield land of environmental value, green infrastructure, biodiversity, geodiversity, ecosystems and landscapes.
- **Water supply, wastewater and water quality** (2019) **[See reference 200]** – Advises on how planning can ensure water quality and the delivery of adequate water and wastewater infrastructure.
- **Brownfield land registers** (2017) **[See reference 201]** – Provides guidance on the purpose, preparation, publication and reviewing of brownfield land registers.
- **Minerals** (2014) **[See reference 202]** – Outlines guidance for planning for mineral extraction in the plan-making and application process.

5.5 The **Environment Act 2021** **[See reference 203]** sets statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity, water, and resource efficiency and waste reduction. It also establishes the Office for Environmental Protection which will act as an impartial and objective body for the protection and improvement of the environment. The Act sets out legislation which covers:

- Resource efficiency, producer responsibility, and the management, enforcement and regulation of waste;
- Local air quality management frameworks and the recall of motor vehicles etc; and
- Plans and proposals for water resources, drainage and sewerage management, storm overflows, water quality and land drainage.

5.6 The Waste (Circular Economy) (Amendment) Regulations **[See reference 204]** seek to prevent waste generation and to monitor and assess the implementation of measures included in waste prevention programmes. They set out requirements to justify not separating waste streams close to source for re-use, recycling or other recovery operations, prohibit incineration and landfilling of waste unless such treatment process represent the best environmental outcome in accordance with the waste hierarchy. The Regulations set out when waste management plans and in waste prevention programmes are required. The Regulations focus on the circular economy as a means for businesses to maximise the value of waste and waste treatment.

5.7 Clean Air Strategy 2019 **[See reference 205]**: The strategy sets out the comprehensive action that is required from across all parts of Government and society to meet these goals. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms. The UK has set stringent targets to cut emissions by 2020 and 2030.

5.8 A Green Future: Our 25 Year Plan to Improve the Environment [See reference 206]: Sets out goals for improving the environment within the next 25 years. It details how the Government will work with communities and businesses to leave the environment in a better state than it is presently. Identifies six key areas around which action will be focused. Those of relevance to this chapter are:

- Using and managing land sustainably:
  - a) Embed a 'net environmental gain' principle for development, including natural capital benefits to improved and water quality.
  - b) Protect best agricultural land.
  - c) Improve soil health and restore and protect peatlands.
- Recovering nature and enhancing the beauty of landscapes:
  - d) Respect nature by using our water more sustainably.
- Increasing resource efficiency and reducing pollution and waste:
  - e) Reduce pollution by tackling air pollution in our Clean Air Strategy and reduce the impact of chemicals.

5.9 The **Environmental Noise Regulations** (2018) **[See reference 207]** apply to environmental noise, mainly from transport. The regulations require regular noise mapping and action planning for road, rail and aviation noise and noise in large urban areas. They also require Noise Action Plans based on the maps for road and rail noise and noise in large urban areas. The Action Plans identify Important Areas (areas exposed to the highest levels of noise) and suggest ways the relevant authorities can reduce these. Major airports and those which affect large urban areas are also required to produce and publish their own Noise Action Plans separately. The Regulations do not apply to noise from domestic activities such as noise created by neighbours; at workplaces; inside means of transport; or military activities in military areas.

5.10 The Road to Zero (2018) **[See reference 208]**: Sets out new measures towards cleaner road transport, aiming to put the UK at the forefront of the design and manufacturing of zero emission vehicles. It explains how cleaner air,

a better environment, zero emission vehicles and a strong, clean economy will be achieved. One of the main aims of the document is for all new cars and vans to be effectively zero emission by 2040.

5.11 Our Waste, Our Resources: A strategy for England (2018) **[See reference 209]** aims to increase resource productivity and eliminate avoidable waste by 2050. The Strategy sets out key targets which include: a 50% recycling rate for household waste by 2020, a 75% recycling rate for packaging by 2030, 65% recycling rate for municipal solid waste by 2035 and municipal waste to landfill 10% or less by 2035.

5.12 The **Water Environment Regulations** **[See reference 210]** protect inland surface waters, transitional waters, coastal waters and groundwater, and outlines the associated river basin management process. These Regulations establish the need to prevent deterioration of waterbodies and to protect, enhance and restore waterbodies with the aim of achieving good ecological and chemical status.

5.13 The **UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations** **[See reference 211]**: Sets out the Government's ambition and actions for delivering a better environment and cleaner air, including £1 billion investment in ultra-low emission vehicles, a £290 million National Productivity Investment Fund, a £11 million Air Quality Grant Fund and £255 million Implementation Fund to help Local Authorities to prepare Air Quality Action Plans and improve air quality, an £89 million Green Bus Fund, £1.2 billion Cycling and Walking Investment Strategy and £100 million to help improve air quality on the National road network.

5.14 The **Nitrate Pollution Prevention Regulations** **[See reference 212]** provides for the designation of land as nitrate vulnerable zones and imposes annual limits on the amount of nitrogen from organic manure that may be applied or spread in a holding in a nitrate vulnerable zone. The Regulations also specify the amount of nitrogen to be spread on a crop and how, where and when to spread nitrogen fertiliser, and how it should be stored. It also

establishes closed periods during which the spreading of nitrogen fertiliser is prohibited.

5.15 The **Water Supply (Water Quality) Regulations** **[See reference 213]** focus on the quality of water for drinking, washing, cooking and food preparation, and for food production. Their purpose is to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring it is wholesome and clean.

5.16 The **Environmental Permitting Regulations** **[See reference 214]** streamline the legislative system for industrial and waste installations into a single permitting structure for those activities which have the potential to cause harm to human health or the environment. They set out how to prevent or, where that is not practicable, to reduce emissions into air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment and human health.

5.17 The **Air Quality Standards Regulations** **[See reference 215]** set out limits on concentrations of outdoor air pollutants that impact public health, most notably particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2). It also sets out the procedure and requirements for the designation of Air Quality Management Areas (AQMAs).

5.18 National Planning Policy for Waste (NPPW) (2014) **[See reference 216]**: Key planning objectives are identified within the NPPW, requiring planning Authorities to:

- Help deliver sustainable development through driving waste management up the waste hierarchy;
- Ensure waste management is considered alongside other spatial planning concerns;
- Provide a framework in which communities take more responsibility for their own waste;

- Help secure the recovery or disposal of waste without endangering human health and without harming the environment; and
- Ensure the design and layout of new development supports sustainable waste management.

5.19 Water White Paper (2012) **[See reference 217]**: Sets out the Government's vision for the water sector including proposals on protecting water resources and reforming the water supply industry. It states outlines the measures that will be taken to tackle issues such as poorly performing ecosystem, and the combined impacts of climate change and population growth on stressed water resources.

5.20 National Policy Statement for Waste Water (2012) **[See reference 218]**: sets out Government policy for the provision of major waste water infrastructure. The policy set out in this NPS is, for the most part, intended to make existing policy and practice in consenting nationally significant waste water infrastructure clearer and more transparent.

5.21 Building Regulations (2010) **[See reference 219]**: requires that reasonable precautions are taken to avoid risks to health and safety cause by contaminants in ground to be covered by building and associated ground.

5.22 Safeguarding our Soils – A Strategy for England (2009) **[See reference 220]**: Sets out how England's soils will be managed sustainably. It highlights those areas which Defra will prioritise and focus attention on tackling degradation threats, including better protection for agricultural soils; protecting and enhancing stores of soil carbon; building the resilience of soils to a changing climate; preventing soil pollution; effective soil protection during construction and dealing with contaminated land.

5.23 Future Water: The Government's Water Strategy for England (2008) **[See reference 221]**: Sets out how the Government wants the water sector to look by 2030, providing an outline of steps which need to be taken to get there. These steps include improving the supply of water; agreeing on important new infrastructure such as reservoirs; proposals to time limit abstraction licences;

and reducing leakage. The document also states that pollution to rivers will be tackled, while discharge from sewers will be reduced.

5.24 The **Air Quality Strategy for England, Scotland, Wales and Northern Ireland** (2007) **[See reference 222]**: Sets out a way forward for work and planning on air quality issues by setting out the air quality standards and objectives to be achieved. It introduces a new policy framework for tackling fine particles and identifies potential new national policy measures which modelling indicates could give further health benefits and move closer towards meeting the Strategy's objectives. The objectives of the Strategy are to:

- Further improve air quality in the UK from today and long term; and
- Provide benefits to health quality of life and the environment.

5.25 The **Urban Waste Water Treatment Regulations** (2003) **[See reference 223]** protect the environment from the adverse effects of urban waste water discharges and certain industrial sectors, notably domestic and industrial waste water. The regulations require the collection of waste water and specifies how different types of waste water should be treated, disposed and reused.

5.26 Environmental Protection Act 1990 [See reference 224]: makes provision for the improved control of pollution to the air, water and land by regulating the management of waste and the control of emissions. Seeks to ensure that decisions pertaining to the environment are made in an integrated manner, in collaboration with appropriate authorities, non-governmental organisations and other persons.

Regional and local

5.27 Joint Municipal Waste Management Strategy for Essex (2007 to 2032) **[See reference** 225**]**: This Joint Municipal Waste Management Strategy (JMWMS) has been developed by the thirteen waste authorities of Essex, comprising Essex County Council, as the Waste Disposal Authority (WDA), and the twelve District and Borough Councils, as the Waste Collection Authorities

(WCAs), in Essex. The strategy sets out key targets and objectives for the Essex Waste Partnership, including to reduce the amount of waste produced and to achieve high levels of recycling.

5.28 Essex Transport Strategy [See reference 226]: The Essex Transport Strategy outlines the County Council's priorities and strategic objectives for improving the transport network across Essex, including by encouraging a modal shift towards public transport, walking and cycling over single occupancy car journeys. The Plan supports the use of cleaner, lower carbon transport technologies, and car share schemes.

5.29 Sustainable Modes of Travel Strategy [See reference 227]: The Sustainable Modes of Travel Strategy aims to reduce the number of private vehicles using the highway network and increase the use of more active and sustainable modes available to businesses, residents and schools within Essex. A key objective is to manage congestion during peak times and improve the environment by reducing the need to travel by car and potentially reducing CO_2 and other emissions.

5.30 South Essex Green and Blue Infrastructure Strategy: Resilient by Nature [See reference 228]: This strategy sets out a vision for and integrated green and blue infrastructure (GBI) network across South Essex and sets out key objectives and projects to achieve this. The protection and enhancement of GBI will help to improve air, water and soil quality throughout the region.

5.31 Green Essex Strategy [See reference 229]: This Strategy seeks to enhance, protect and create an inclusive and integrated network of high-quality green infrastructure in Greater Essex, to create a county-wide understanding of green infrastructure – its functions and values, and to identify opportunities for implementing green infrastructure. The Strategy recognises the importance of GI in terms of environmental benefits, including improving air, water and soil quality. The Strategy highlights the importance of GI in providing ecological networks of all scales, from regional to neighbourhood scale.

5.32 Transport East Active Travel Strategy [See reference 230]: The vision for the region is that half of all journeys within towns and cities (up to three miles from the urban centre) will be made by walking and cycling. By 2050, half of all trips in the Transport East region will be made by walking or cycling. In Thurrock, a "Go Dutch" scenario (which applies Dutch rates for cycle commuting in England adjusting for distance and hilliness) would result in almost a twelve-fold increase of the population who could commute to work by cycle, to 24.9%.

5.33 Transport East Draft Transport Strategy [See reference 231]: The Draft Transport Strategy aims to outline a collective vision for the future of transport in the region and set out key investment priorities needed to deliver it. The overarching vision is underpinned by four strategic priorities: decarbonisation to net-zero, connecting growing towns and cities, energising coastal and rural communities, and unlocking international gateways. The four strategic priorities overlap and together form an integrated strategy for the region. The Draft Transport Strategy sets out the pathways and key goals needed for the delivery of their Vision, which include goals focused around improving sustainable and active travel options, reducing demand for travel via digital connectivity, encouraging behaviour change, increasing access for coastal and rural communities, improving efficiency of freight transport, and creating better connected ports and airports to unlock international gateways.

5.34 Section 5 of the Draft Transport Strategy highlights place-based strategic corridors which link key destinations with the region. For Thurrock, this includes improved links with South Essex, London, Basildon and Southend. The Strategy identifies the area as a major location for economic growth, particularly in relation to the major international ports at London Gateway, Purfleet and Tilbury (now Thames Freeport). At present, the area is heavily congested which acts as a major barrier to growth. The Strategy identifies the need for improved road, freight capacity, passenger rail and bus networks to support economic and population growth in the region.

5.35 South East Inshore Marine Plan [See reference 232]: The Plan introduces a strategic approach to planning within the inshore waters between Suffolk and Kent, including the Thames Estuary. This includes building

resilience and adaptations to climate change, as well as consideration of renewable energy and potential for carbon capture and storage.

5.36 Thurrock Climate Change Scoping Study [See reference 233]: The Thurrock Climate Change Scoping Study was commissioned in 2019 to inform the integration of climate change into the Council's planning policy, in accordance with NPPF. The study's aims are to provide a baseline assessment of the Borough's current climate impacts (emissions) and risks (hazards); summarise existing climate change legislation and policy; review existing documents, local plan processes, policy and operation; outline initiatives to focus on in the Local Plan; and to define what the requirements should be if a climate change strategy were to be developed for the Borough. The study provides a series of recommendations and next steps for the process including stakeholder engagement and establishing timescales and accountability. It also highlights core focus areas and priorities for the Borough including land-use and access issues, carbon emissions relating to buildings, retail and industry, infrastructure, natural resources, the environment and waste.

5.37 Draft Thurrock Transport Strategy (internal draft, currently unpublished): The Interim Draft Transport Strategy builds on the existing Transport Strategy (2013 – 2026), taking into account much of the rapid change Thurrock is undergoing, including major regeneration projects and proposed development which will fundamentally alter the way people and goods move around Thurrock and the wider region over the next 20 years. Key projects include Grays Town Centre regeneration, the port expansion of Tilbury and London Gateway, proposed development of a logistics 'superhub' at Thames Enterprise Park, the Thames Freeport, Purfleet regeneration, and the proposed construction of the Lower Thames Crossing (LTC). The Draft Transport Strategy outlines key challenges and opportunities for Thurrock which include supporting sustainable economic growth, supporting the health and wellbeing of Thurrock's residents and addressing the Climate Emergency. These factors inform the Transport Vision Statement ('Connecting Thurrock'), as well as 10 interconnected overarching goals and nine strategic focus areas specified in the Draft Transport Strategy. The Draft Transport Strategy will be supported by a series of shorter-term delivery documents, setting out more specific actions that aim to achieve the overarching vision and goals.

5.38 Thurrock Transport Strategy 2013-2026 [See reference 234]: The strategy sets out the aims, objectives and policies for delivering transport improvements in Thurrock, including (but not limited to) to respond to large scale growth at Lakeside, Tilbury Port and London Gateway. The strategy focusses on the need to address the following key areas: Delivering Accessibility, Tackling Congestion, Improving Air Quality and Addressing Climate Change, Safer Roads and Facilitating Regeneration. This strategy also sets out the long-term approach to walking and cycling in the Borough.

5.39 Thurrock Local Flood Risk Management Strategy [See reference 235]: This strategy sets out how Thurrock Council, alongside other Risk Management Authorities (RMAs), are responding to identified flood risk in Thurrock. Among other things, the strategy specifies the flood and coastal erosion risk management functions that may be exercised by RMAs, objectives and measures for managing local flood risk and implementation details for these.

5.40 2020/2021 Air Quality Annual Status Report [See reference 236]: The 2020/21 Thurrock Air Quality Annual Status Report provides the most recent overview of air quality within Thurrock, as well as identifying actions that have been undertaken to improve it and the Council's future priorities. The report highlights that the main pollutant of concern in Thurrock is nitrogen dioxide (NO_2), and to a lesser extent particulate matter (PM_{10}), both arising from road traffic emissions. NO_2 was monitored at 67 diffusion tube sites and three automatic monitoring sites across the Borough in 2020. The report notes the limitations of using 2020 data due to the travel restrictions as a result of the COVID-19 pandemic and provides 2019 figures for reference. The Council plans to conduct a detailed and up to date assessment of all declared AQMAs across the Borough.

5.41 Thurrock Air Quality and Health Strategy [See reference 237]: The overarching aim of the strategy is to improve air quality in the Borough in order to reduce the health impacts of air pollution. The report outlines the baseline conditions for both air quality and health in the Borough, and highlights the correlation between the two. It highlights the dangers of certain pollutants and the need to act faster to reduce levels of harmful emissions due to impacts on public health. The report presents a strategy which includes to reduce transport

emissions; tackle health inequalities; explore options for the implementation of clean air zones; and ensure air quality policies will be incorporated into future development, regeneration and planning guidance. The strategy also outlines the Air Quality Action Plan (AQAP) for all AQMAs, as well as Borough-wide interventions. The implementation of the strategy will be monitored and progress on air quality assessed.

5.42 Municipal Waste Strategy for Thurrock 2021-2031 [See reference 238**]**: The Municipal Waste Strategy is a 'living document' and acts as the tool to improve and increase the Borough's recycling performance. The strategy outlines the current local picture of waste in the Borough, provides analysis of public consultation, and identifies the Council's strategic objectives. Key actions that will be undertaken to succeed include effective engagement and communications with local residents providing information and education to households; ensuring a reliable carbon-efficient collection service; and engagement with front-line staff to deliver the changes needed.

5.43 As part of the preparation of the Local Plan, Thurrock Council is currently preparing a **Climate Change Strategy**, **Water Cycle Study, Transport Strategy**, **Green and Blue Infrastructure Strategy** which will be taken into account in the next iteration of the IIA. A separate and stand-alone **Minerals and Waste Local Plan** will also be prepared by the Council.

Implications of the policy review for the Local Plan and IIA

In order to align with the international, national, regional and local policies outlined above, the Local Plan should seek to minimise the contamination of land, water and air, and to ensure the effective management of waste and water and the efficient extraction of minerals. The IIA is able to respond to this through the inclusion of IIA objectives relating to air pollution, water

quality, land contamination, waste management, and the efficient use of land.

Baseline information

Geology and minerals

Current baseline information

5.44 The County of Essex, including Thurrock, has extensive deposits of sand and gravel. There are more localised deposits of silica sand, chalk, brickearth and brick clay. There are no rock deposits in the County, so this material must be imported into Essex.

5.45 Thurrock is a unitary authority, required to plan for an adequate and steady supply of mineral resource to meet its own need, and contribute to the region's need. At present, minerals planning in Thurrock is guided by relevant policies in the adopted Core Strategy (2015) **[See reference** 239**]**.

5.46 Thurrock lies on four main types of underlying geology in the north of the Borough: the Thames Group (clay, silt, sand and gravel); the Lambeth Group (clay, silt, sand and gravel); Thanet formation (sand, silt and clay); and the White Chalk Subgroup (chalk) **[See reference 240]**. In the south of the Borough, near Purfleet and Grays, there is a band of upper chalk, exposed at the surface. This is the oldest rock is the Borough and was extensively quarried for the Portland cement industry, particularly around West Thurrock and Grays **[See reference 241]**. Figure 5.1 shows the different types of geology in the Borough.

5.47 The Borough contains safeguarded mineral resources including two operational sand and gravel quarries in Thurrock at Dansand Quarry and Orsett

Quarry. Mill House Farm ceased operation in 2020. There are two non-operational sand and gravel quarries at Medina Farm and East Tilbury Quarry **[See reference** 242**]**. The River Thames has been a major route for transhipment and distribution of aggregates. Hard rock and marine dredged aggregates are landed in Thurrock with the material distributed within the Borough, the wider region and London. There are a total of 11 transhipment facilities in Thurrock at Port of Tilbury, Tilbury 2, Tilbury Docks, Purfleet Wharf, Thurrock Marine Terminal, DP World Berth **[See reference** 243**]**.

5.48 There are currently four mineral sites in Thurrock with permitted extraction of sand and gravel although not all are operational:

- Dansand Quarry, Orsett –This site is operational and continues with limited mineral extraction of sand and gravel as well as recycling of aggregates. Permission includes the restoration of the quarry site after extraction of minerals by 2025.
- Orsett Quarry – This site is currently a mothballed sand and gravel quarry. Current activity includes the restoration of the south western part of the site as a wildlife area. An outstanding application submitted to the Council seeks extension southwards and for further mineral extraction of sand and gravel.
- Mill House Farm, West Tilbury – Permission granted for mineral extraction of sand and gravel as part of the provision of an agricultural reservoir. This application is being implemented.
- Medina Farm, South Ockendon – Permission granted by Thurrock Council for limited mineral extraction prior to restoration of land. The permission has not yet been implemented. Part of the proposed site falls within London Borough of Havering, which has yet to grant permission for a separate application.

5.49 In association with the extraction of minerals, there are also four marine wharfs (at London Gateway Berth 7 DP World; Thurrock Marine Terminal, Tilbury Docks and Port of Tilbury); three rail terminals (at Purfleet Rail Depot; Tilbury Bulk Rail Terminal; Tilbury 2 Rail Terminal); and 10 aggregate recycling sites.

Projected baseline information

5.50 There are several notable major development/construction projects, that are either planned, programmed or underway in Thurrock, which will require significant amounts of mineral resources in the future:

- Lower Thames Crossing led by National Highways as a NSIP, expected in 2029/30.
- A13 Widening (A128 to A1014) led by Thurrock Highways, work underway, near completion.
- London Gateway Port led by DP World, via a Local Development Order, expected in 2023 or beyond.
- Tilbury Link Road – Led by National Highways (no longer part of the LTC NSIP, now a standalone project).
- A13 East Facing Slip Road – The project is a long-held ambition for the Council and will improve operation of the local road network.

Soils

Current baseline information

5.51 The Agricultural Land Classification (ALC) system classifies agricultural land in five categories according to versatility and suitability for growing crops. The main settlements are classified as 'urban'. A number of areas are classified as 'other land primarily in non-agricultural use'. Thurrock also contains a large amount of productive agricultural land:

- The majority of land north of the A13 in Thurrock is Grade 3 (i.e. good to moderate);
- Land south of the A13, surrounding urban areas is a mixture of Grade 2 and 3 (i.e. very good and good to moderate); and

- There are areas of Grade 1 (excellent) land near the M25, north of South Ockendon and surrounding Aveley **[See reference 244]**.

5.52 Figure 5.2 shows the range of agricultural land grades in the Borough.

5.53 Soilscapes published by Cranfield University **[See reference 245]** shows what the likely soil conditions are in the landscape by reference to one of 27 different broad types of soil. The main soil types in Thurrock include:

- Large areas north of the A13 have slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. This soil has moderate fertility.
- Loamy and clayey floodplain soils with naturally high groundwater. This soil has moderate fertility.
- Loamy soils with naturally high groundwater. This soil has low fertility.
- Freely draining slightly acid loamy soils. This soil has low fertility.
- Freely draining slightly acid but base-rich soils. This soil has high fertility.
- Slightly acid loamy and clayey soils with impeded draining. This soil has moderate to high fertility.
- Loamy and clayey soils of coastal flats with naturally high groundwater, along the coast of the River Thames. This soil has lime-rich to moderate fertility.

5.54 Figure 5.3 shows the range of soil types in the Borough.

Projected baseline information

5.55 Soil is a finite natural resource which regenerates only over extremely long geological timescales and provides many essential services including food production, water management and support for valuable biodiversity and ecosystems. It also plays a role in preventing climate change as a larger storer of carbon.

5.56 Soils in England have degraded significantly over the last two decades due to intensive agricultural production and industrial pollution and continue to face threats. These are:

- Soil erosion by wind and rain, affects the productivity of soils as well as water quality and aquatic ecosystems;
- Compaction of soil, reduces agricultural productivity and water infiltration, and increased flood risk through higher levels of runoff; and
- Organic matter decline, affects the supply of nutrients in soil moister (particularly during summer and autumn months) in the future, which is likely to affect the natural environment and landscape.

Contaminated land

Current baseline information

5.57 Thurrock has an extensive industrial, quarrying and land-filling past. Due to this, the area has a legacy of contaminated land. In accordance with Section 78R of the Environmental Protection Act 1990, the Council is required to maintain a public register of contaminated land, which serves as a permanent record of all regulatory action undertaken to ensure remediation of any site that has been classified as contaminated.

5.58 Contaminated sites identified within Thurrock include waste and former landfill sites, which previously accepted waste from London and the southeast, dockyards, power stations, cement or asbestos manufacturers, petrochemical installations, petroleum storage sites, diesel storage tanks, paper manufacturers and agricultural activities (mainly north of the A13) **[See reference 246]**.

Projected baseline information

5.59 Given the technical challenges and associated costs of developing contaminated sites, these are likely to remain in their current state in the absence of policies that support appropriate opportunities to remediate contaminated land.

LUC

Figure 5.1: Bedrock geology

- Thurrock Council boundary
- Neighbouring authority boundary
- Bracklesham group and barton group
- Thames group - clay, silt, sand and grit
- Thanet sand formation - sand, silt and clay
- Lambeth group - clay, silt, sand and gravel
- Grey chalk subgroup - chalk
- White chalk subgroup - chalk

Epping Forest
Brentwood
Chelmsford
Basildon
Rochford
Havering
Barking and Dagenham
Castle Point
Bexley
Dartford
Gravesham
Medway
Sevenoaks
Bromley

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_1_6999_Bedrock_geology_A3L 26/04/2022
Source:LUC, TC, BGS

THURROCK COUNCIL

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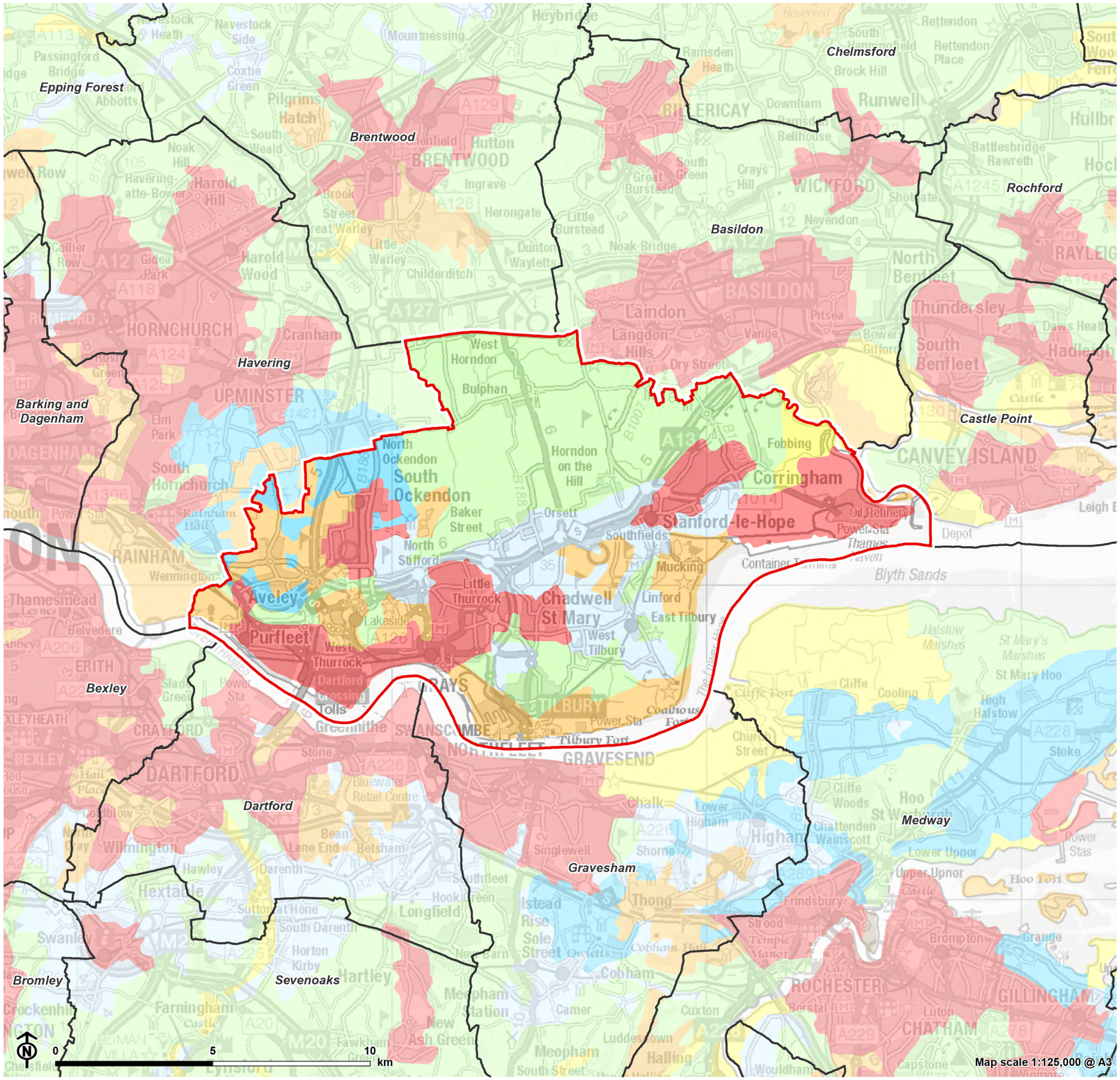
Figure 5.2: Agricultural land classification



CB:AHB EB:Tomlinson_J LUC FIG5_2_6999_ALC_A3L 25/04/2022
Source:LUC, TC, NE

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Figure 5.3: Soil types

- Thurrock Council boundary
- Neighbouring authority boundary
- Lightest soil
- Medium and/to light
- Medium soil
- Medium and/to heavy
- Heaviest soil
- Mixed or organic

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_3_6999_Soil_types_A3L 25/04/2022
Source:LUC, TC, BGS

THURROCK COUNCIL

Waste

Current baseline information

5.60 The Municipal Waste Strategy for Thurrock 2021-2031 **[See reference 247]** sets out the current status of waste management in Thurrock. The Council currently provides a weekly collection of refuse, recycling and garden and food waste from around 69,000 households in the Borough with 77,524 tonnes of household waste produced in 2019/20. Thurrock also have a successful commercial/trade waste collection from which the waste-tonnages collected contribute to the Council's overall targets.

5.61 The Strategy states that Thurrock's recycling performance has not improved over the past six years and has seen a steady decline to stagnation since 2014/15. Recycling rates were approximately 35% in 2020, which is lower than both the 2020 national target of 50% and the average recycling rate in England, at 45%. Recycling waste from Thurrock is disposed of in East London, restricting the capacity and frequency of collections in the Borough. The Strategy states that renewal of disposal contracts offers the opportunity to redress this issue. The Council's core objective is to increase Thurrock's recycling to 45% by 2025 and 50% by 2030.

Projected baseline information

5.62 In terms of how waste arisings are managed, recent trends are predicted to continue; with gradual reductions in the proportion landfilled and gradual increased in the amount incinerated. Recycling trends since 2014/15 suggest the recycling rates will remain at a similar level without significant intervention. These projections are also highly dependent on other variables, including population growth, implementation of large regeneration and infrastructure projects, and the amount of waste that is imported from outside the Borough.

Water

Current baseline information

5.63 Thurrock is located within the South Essex Catchment Partnership (SECP) area **[See reference 248]**. The South Essex Catchment covers Mardyke Valley in the west of Thurrock, and a number of small tributaries of the Thames Estuary to the east. The SECP Plan (2021) **[See reference 249]** outlines the key features of the catchment area and the main threats it is facing. The SECP prioritises projects that seek to tackle issues involving water quality, flood risk, habitats and wildlife and health and wellbeing, aligning with improving the catchment's Water Framework Directive status. It is further supported by the Thames River Basin District River Basin Management Plan. Thurrock is also partially located within the Thames Estuary 2100 plan area **[See reference 250]**, which sets out how the Environment Agency and partners can work together to manage flood risk, adapt to the challenges of climate change, ensure sustainable and resilient developments, protect social, commercial and cultural value, and enhance and restore ecosystems within the Thames estuary.

5.64 The Thurrock is located on the River Thames however, the main watercourse flowing through Thurrock is the River Mardyke. This flows for 11 miles from its source near little Warley, through the Borough until it meets the River Thames at Purfleet. The flow from the Mardyke to the Thames is controlled by a sluice located at the confluence of the two rivers, and the Mardyke becomes tide-locked for several hours each tidal cycle. This exacerbates the low flow conditions and can result in low dissolved oxygen concentrations during the summer months. Other watercourses in the Borough are Stanford Brook and Vange Creek/Holehaven Creek.

5.65 The Water Framework Directive, transposed by the Water Framework Regulations, aims to achieve high or good status for surface water in all members states by 2027. According to the Draft Thames River Basin Management Plan **[See reference** 251**]**, the Thames Lower and Thames Middle waterbodies were of 'moderate' ecological status in 2019. The chemical

status for both sections of the river was 'fail'. Reasons for not achieving good ecological and chemical status are largely related to contamination from industry, landfill leaching, sewage discharge, urban development, transport, as well as physical modification from various activities. The Mardyke and its tributaries were also considered to be in 'moderate' ecological health. The chemical status for the river and its tributaries in 2019 was also 'fail'. The main reasons for the water body and its tributaries not achieving good ecological and chemical status were sewerage discharge from the water industry, physical modification of the river, land drainage, high levels of phosphate from agricultural runoff from rural areas, industry discharge and a number of other unknown activities that are pending investigation **[See reference** 252**]**.

5.66 Groundwater within the South Essex Catchment is held within a chalk aquifer to the south and a gravel aquifer to the north. Within Thurrock, the overall groundwater status is generally poor. Although quantitative status (the amount of groundwater) is largely good aside from the far south of the catchment, the chemical status is poor throughout.

5.67 There are a number of water-dependent Sites of Special Scientific Interest (SSSI) in the Mardyke Valley, at Grays Chalk Pit and West Thurrock Lagoon and Marshes. The coastal strip to the east of the Borough also contains a number of internationally important habitat sites, including the Thames Estuary and Marshes Special Protection Area and RAMSAR site and a number of grazing marsh SSSIs.

5.68 Source Protection Zones (SPZs) are defined around large and public potable groundwater abstraction sites, and they provide additional protection to safeguard drinking water quality by constraining the proximity of an activity that can impact the quality of drinking water. There are two SPZs within Thurrock, in Linford and North Stifford. The entire catchments of these two zones fall within the Borough boundary **[See reference 253]**.

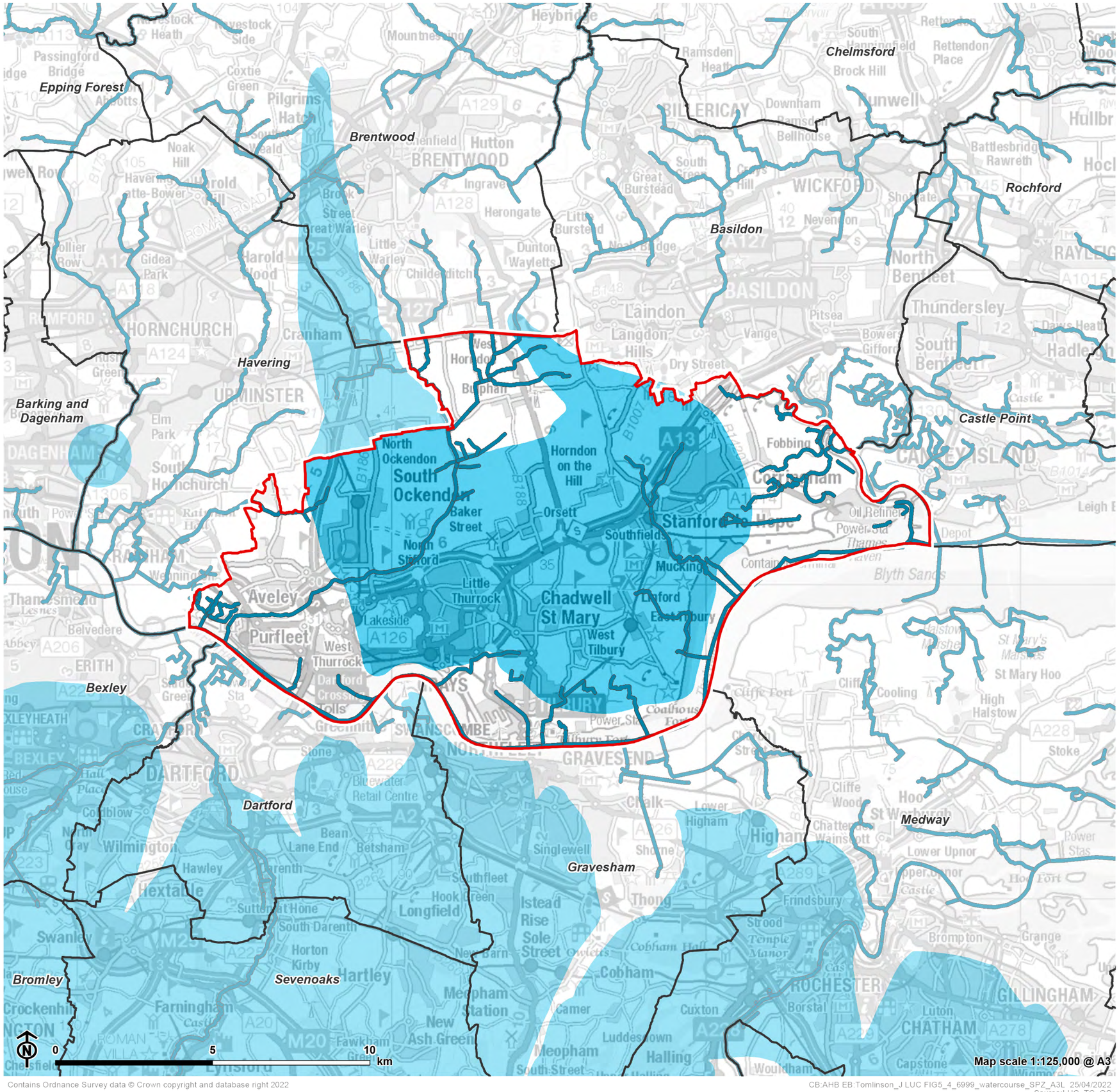
5.69 The location of SPZs and the main watercourses in the Borough are shown in Figure 5.4.

Projected baseline information

5.70 Under predicted climate change scenarios, more frequent drought conditions are expected in the East of England, along with increased demands on water resources. Future developments will create additional demand for water abstraction from surface and groundwater sources in Thurrock. At a high level, it is broadly assumed that the quality of water bodies including the Thames and Mardyke will improve in line with WFD objectives. However, water quality is influenced by a wide range of internal and external factors, including climate change, geology and soils, human consumption and population change, and pollution from human activities such as industry and agriculture. Future development, particularly in areas close to water bodies, may present a challenge in improving water quality.

LUC

Figure 5.4: Watercourses and Source Protection Zones



CB:AHB EB:Tomlinson_J LUC FIG5_4_6999_watercourse_SPZ_A3L 25/04/2022
Source:LUC, TC, OS

THURROCK COUNCIL

Air

Current baseline information

5.71 Thurrock's Air Quality Annual Status Report 2020/21 **[See reference 254]** outlines the status and key issues associated with air quality in Thurrock. Thurrock currently has 18 Air Quality Management Areas (AQMAs). These are located mainly in the west of the Borough, close to major transport routes such as the M25 and A13 and are a result of traffic related pollution along busy roads used for commuter traffic or logistical purposes. The routes are often saturated with traffic during peak hours and there are many areas where there is relevant public exposure, predominantly in the form of residential dwellings in close proximity.

5.72 The main pollutant of concern in Thurrock is nitrogen dioxide (NO_2) and to a lesser extent, particular matter (PM_{10}) – both of these pollutants arise from road traffic emissions. Thurrock only has AQMAs declared for road traffic-based emissions; there are no industrial based AQMAs. The AQMAs are all declared for exceedance of the long-term objective for the protection of human health for NO_2 (40 µg/m^3).

5.73 Thurrock Council currently monitor $PM_{2.5}$ at one location in Stanford-le-Hope (Thurrock 3). The annual mean has remained well below the objective of 25µg/m^3 over the past 5 years, however an increase in the annual average concentration was recorded in 2019 and remained at a similar level in 2020.

5.74 There is also currently one location monitoring sulphur dioxide (SO_2) in the Borough located in Grays. SO_2 concentrations were below air quality objectives in 2019 and 2020, with no exceedances reporting in either year.

5.75 In addition to their potential negative effects on human health, emissions of nitrogen oxides (NO_X) and particulate matter (PM) can affect ecosystems. It is likely that the strongest effect of emissions of nitrogen oxides across the UK is

through their contribution to total nitrogen deposition. All plants need nitrogen to grow but if too much nitrogen is present, it becomes a pollutant and can result in biodiversity change. Nitrogen deposition can also increase the risk from abiotic factors (e.g. drought and frost) or cause acidification of soils. As well as these effects of nitrogen deposition, direct effects can occur on habitats and species where there is high exposure (e.g. habitats adjacent to motorways and large highways, and habitats in and around urban centres). Particulates (i.e. $PM_{10,}$ $PM_{2.5}$) are essentially dust emissions that can settle on vegetation **[See reference** 255**]**.

5.76 Figure 5.5, Figure 5.6 and Figure 5.7 shows air quality (including concentrations of NO_2, PM2.5 and PM10) in the Borough. Figure 5.8 shows where AQMAs are designated in the Borough and surrounding areas.

Projected baseline information

5.77 If pollutant concentrations continue to fall, it will be the Council's aim to review some of its AQMA's with the intention of either reducing the current size of them or revoking some entirely. In 2016 the Council undertook a detailed modelling assessment to re-determine the extent of NO_2 and PM_{10} exceedances over most of the Borough, including all AQMAs. It found that eight AQMAs should be revoked for NO_2 and all four for PM_{10}. The Council planned to monitor these locations for at least three years and make a determination in 2020. Due to the COVID-19 pandemic, the decision to revoke these AQMAs has been delayed.

5.78 There is a possibility that air quality may worsen in the long-term as a result of climate change, due to a greater likelihood of prolonged periods of still, dry days, and to-date this relationship has been difficult to predict. This will need to be taken into account in the development of air quality action plans and monitoring regimes, as will the effects of major infrastructure developments such as the Lower Thames Crossing and London Gateway.

LUC

Figure 5.5: Air Quality (NO2 concentration)

Thurrock Council boundary

Neighbouring authority boundary

NO2 concentration (parts per million)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30
- 30.1 - 35
- 35.1 - 40
- 40.1 - 45

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_5_6999_Air_quality_NO2_A3L 26/04/2022
Source:LUC, TC, DEFRA

THURROCK COUNCIL

Figure 5.6: Air Quality (Particulate matter 2.5 concentration - PM 2.5)

Thurrock Council boundary
Neighbouring authority boundary

PM 2.5 (parts per million)

- 0 - 2.5
- 2.6 - 5
- 5.1 - 7.5
- 7.6 - 10
- 10.1 - 12.5
- 12.6 - 15
- 15.1 - 17.5

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_6_6999_Air_quality_pm2_5_A3L 25/04/2022
Source:LUC, TC, DEFRA

LUC

Figure 5.7: Air Quality (Particulate matter 10 concentration - PM 10)

Thurrock Council boundary

Neighbouring authority boundary

PM 10 (parts per million)

- 0 - 2.5
- 2.6 - 5
- 5.1 - 7.5
- 7.6 - 10
- 10.1 - 12.5
- 12.6 - 15
- 15.1 - 17.5
- 17.6 - 20
- 20.1 - 22.5

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_7_6999_Air_quality_pm10_A3L 26/04/2022
Source:LUC, TC, DEFRA

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LUC

Figure 5.8: Air Quality Management Areas (AQMAs)

Thurrock Council boundary
Neighbouring authority boundary
AQMA

Epping Forest
Brentwood
Chelmsford
Basildon
Rochford
Havering
Barking and Dagenham
Castle Point
Bexley
Dartford
Gravesham
Medway
Bromley
Sevenoaks

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG5_6_6999_Air_quality_AQMA_A3L 25/04/2022
Source:LUC, TC, DEFRA

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Implications for health

5.79 Air pollution is associated with a number of adverse health impacts and is recognised as a contributing factor in the onset of heart disease and cancer. Pollution particularly affects the most vulnerable in society such as children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation between poor air quality areas and less affluent areas. Thurrock Air Quality and Health Strategy **[See reference 256]** sets out the Council's overarching objectives, policies and actions to improve air quality.

5.80 Research from the British Lung Foundation **[See reference 257]** highlighted that background $PM_{2.5}$ levels (2018) were at 11.45µg/m3, which is in breach of WHO limits (10µg/m3) and is considered dangerously high. The worst performing location was on the A282 Dartford Crossing. The research suggests that in 2018 an estimated 6.14% of deaths were attributable to $PM_{2.5}$ air pollution, which was equivalent to 78.6 deaths. Further to this, Thurrock has 67 nurseries, schools and colleges in areas where levels of fine particulate matter ($PM_{2.5}$) are above the World Health Organisation's recommended limit.

5.81 A correlation can be observed between recorded health issues within Thurrock and the presence of AQMAs. For instance, declared AQMAs in areas such as Tilbury Riverside and Thurrock Park Way alongside West Thurrock and South Stifford have above average incidences of lung cancer within their populations. Similarly, West Thurrock, South Stifford, Purfleet, Aveley and Tilbury, all of which have one or more AQMAs, had extremely high emergency admissions for Chronic Obstructive Pulmonary Disorder (COPD). AQMAs within Purfleet, West Thurrock and Aveley also fall within the 20% most deprived areas in the country for living environment, which includes air pollution indicators. There is a prevalence of HGVs in nearly all of these areas **[See reference 258]**.

5.82 Poor water quality can increase the risk of water-borne disease. In addition, there is potential for negative health effects from exposure to heavy metals in soils and contaminated soil.

Key sustainability issues and likely evolution of these issues without the Local Plan

Geology and minerals

5.83 The Borough contains safeguarded mineral resources which, where possible, should not be lost or compromised as new development occurs. The level of development proposed in the Local Plan, in addition to several notable major development/construction projects that are either planned, programmed or underway in Thurrock, will require significant amounts of mineral resources. With the closure of many of the Borough's mineral extraction sites and their subsequent conversion to other uses such as nature sites and green space, minerals required for construction are likely to be increasingly imported to the Borough from elsewhere.

5.84 Without the Local Plan, it is possible that development could result in unnecessary sterilisation of mineral resources thereby preventing their use for future generations. The Local Plan provides an opportunity to safeguard existing mineral reserves; to plan and monitor reserves to ensure an adequate and steady supply of minerals is available; and to support the sustainable transport of minerals via rail to avoid traffic congestion and air pollution, particularly in sensitive areas such as AQMAs.

Soils

5.85 Thurrock comprises large swaths of high quality, productive agricultural land which is under pressure from new development and climate change.

5.86 In the absence of the Local Plan, the NPPF would apply which supports the reuse of brownfield land and states that planning policies and decisions should contribute to and enhance the natural and local environment by "recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land" (para. 174b). However, the Local Plan provides an opportunity to strengthen this approach to ensure these natural assets are not lost or compromised by prioritising brownfield sites and lower quality agricultural land for development and by safeguarding higher quality agricultural land.

Contaminated land

5.87 There are several contaminated sites in Thurrock including waste and former landfill sites, dockyards, power stations, cement or asbestos manufacturers, petrochemical installations, petroleum storage sites, diesel storage tanks, paper manufacturers and agricultural activities (mainly north of the A13).

5.88 In the absence of the Local Plan, the NPPF would apply which supports the remediation of degraded, derelict, contaminated and unstable land, where appropriate (para 174f). However, the Local Plan provides an opportunity to encourage the remediation of contaminated land and to support the use of previously developed land over greenfield land when allocating sites for new development. Without the Local Plan, this issue would be less well addressed.

Waste

5.89 New development will generate additional waste which should be managed according to the waste hierarchy. Recycling rates were approximately 35% in 2020, which is lower than both the 2020 national target of 50% and the average recycling rate in England of 45%.

5.90 In the absence of the Local Plan, the National Planning Policy for Waste **[See reference 259],** Joint Municipal Waste Management Strategy for Essex **[See reference** 260**]**, and the Municipal Waste Strategy for Thurrock 2021-2031 **[See reference** 261**]** would apply which support driving waste management up the waste hierarchy. However, the Local Plan provides an opportunity to:

- Require developments to use locally sourced, reclaimed, recycled or low environmental impact products in design and construction;
- Provide adequate space in new developments for waste facilities capable of accommodating general waste, recyclable waste and compostable waste;
- Ensure site allocations do not compromise the operation of nearby waste management facilities; and
- Ensure sufficient land is available in appropriate locations for new waste management facilities.

Water

5.91 The Mardyke river and its tributaries are failing to meet the Water Framework Directive objective of 'good' ecological and chemical status. The main reason for the water body and its tributaries not achieving good ecological and chemical status is due to sewerage discharge from the water industry, physical modification of the river, land drainage, high levels of phosphate from agricultural runoff from rural areas, industry discharge and a number of other unknown activities that are pending investigation. Pollution from surface water runoff from both agriculture and urban areas can occur during extreme weather events which are more likely to occur with climate change. Increased levels of phosphate from agricultural practices and the water industry are reaching the Mardyke river and its tributaries which can cause eutrophication resulting in adverse impacts on habitats and species. Thurrock's groundwater status is generally poor. Water resources in the East of England, including Thurrock, will be in deficit by 1.6 billion litres per day by the 2050s **[See reference** 262**]**.

5.92 Without the Local Plan, it is possible that unplanned development could be located in areas that could lead to further water quality issues and risks to the natural environment. However, existing safeguards, such as the Water Framework Regulations, would help to reduce the potential for this to occur. The Local Plan provides an opportunity to ensure that development is located and designed to take into account the sensitivity of the water environment, water-dependent protected sites, to plan for adequate wastewater infrastructure, to incorporate sustainable drainage systems (SuDS), and to promote water efficiency and grey water recycling. The Local Plan also presents an opportunity to include a policy which would address the specific issue of phosphate entering the Mardyke and its tributaries.

Air

5.93 There are 18 AQMAs in Thurrock which have been designated because these areas exceed safe levels of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) for human health, these pollutants arising primarily from road traffic emissions. Changes in air quality also present risks to the natural environment, both at protected sites and more widely.

5.94 In the absence of the Local Plan, the policies in the NPPF and the Clean Air Strategy **[See reference 263]** would apply which support measures to improve air quality through traffic and travel management; to develop and enhance green infrastructure; and to direct new development to sustainable locations which limits the need to travel and offer a choice of transport modes. However, without targeted action at the Borough-level, it is anticipated that traffic congestion will continue to increase with the rising population and car dependency may continue to be high. The Local Plan provides an opportunity to contribute to improved air quality in the Borough through:

- Locating development sustainably (with good access to services and sustainable transport modes);
- Supporting sustainable travel choices (e.g. requiring sustainable modes to be available on occupation of new homes and workplaces);

- Supporting the uptake of electric vehicles and e-bikes through the provision of electric vehicle charging infrastructure;
- Specifying a requirement for applications for major development to include an assessment of their air quality impacts as part of their Transport Assessments/Statements; and
- Specifying a requirement for major developments which may impact on areas at risk of exceeding EU limit values to provide for ongoing air quality monitoring that confirms the effectiveness of proposed mitigation of the traffic and air quality impacts of development.

Chapter 6

Climate change adaptation and mitigation

Policy context

International

6.1 United Nations Paris Climate Change Agreement (2015) **[See reference 264]**: International agreement to keep global temperature rise this century well below 2 degrees Celsius above pre-industrial levels.

6.2 The **2030 Agenda for Sustainable Development** (2015) **[See reference 265]**: This initiative, adopted by all United Nations Member States, provides a shared blueprint for peace and prosperity for people and the planet and includes 17 Sustainable Development Goals (SDGs), designed to achieve a better and more sustainable future for all. Relevant to this topic are:

- SGD 7: Affordable and Clean Energy
- SDG 11: Sustainable Cities and Communities
- SDG 12: Responsible Consumption and Production
- SDG 13: Climate Action
- SDG 14: Life Below Water
- SDG 15: Life on Land

National

6.3 The **NPPF** (2021) **[See reference 266]** contains as part of its environmental objective a requirement to mitigate and adapt to climate change, "including moving to a low carbon economy". The document also states that the "planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change". To achieve these aims new development should be planned to ensure appropriate adaptation measures are included (including green infrastructure) and should be designed, located and orientated as to help to reduce greenhouse gas emissions.

6.4 The revised framework also requires that development is directed away from areas which are at highest existing or future risk of flooding. Where development is required in such areas, the "development should be made safe for its lifetime without increasing flood risk elsewhere".

6.5 In relation to coastal change in England planning policies and decisions should take account of the UK Marine Policy Statement and marine plans. Furthermore, plans should "reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbating the impacts of physical changes to the coast".

6.6 The NPPF is supported by planning practice guidance relating to:

- **Flood risk and coastal change** (2021) **[See reference 267]** – Provides guidance on how the planning process can assess, avoid, manage and mitigate the risks associated with flooding and coastal change.
- **Climate change** (2019) **[See reference 268]** – Advises how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change.
- **Renewable and low carbon energy** (2015) **[See reference 269]** – Outlines guidance for developing a strategy for renewable and low carbon energy, and particular planning considerations for hydropower, solar technology, solar farms and wind turbines.

6.7 The **Environment Act 2021** **[See reference 270]** sets statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity, water, and resource efficiency and waste reduction. The Environment Act will deliver:

- Long-term targets to improve air quality biodiversity, water, and waste reduction and resource efficiency;
- A target on ambient PM2.5 concentrations;
- A target to halt the decline of nature by 2030;
- Environmental Improvement Plans, including interim targets;
- A cycle of environmental monitoring and reporting;
- Environmental Principles embedded in domestic policy making; and
- Office for Environmental Protection to uphold environmental law.

6.8 The **Net Zero Strategy: Build Back Greener** (2021) **[See reference 271]** sets out policies and proposals for decarbonising all sectors of the UK economy to meet net zero targets by 2050. It sets out strategies to keep the UK on track with carbon budgets, outlines the National Determined Contribution (NDC) and sets out the vision for a decarbonised economy in 2050. Its focus includes:

- Policies and proposals for reducing emissions across the economy in key sectors (power, fuel supply and hydrogen, industry, heat and buildings, transport, natural gas and waste); and
- Policies and proposals for supporting transition across the economy through innovation, green investment, green jobs, embedding net-zero in government, local climate action, empowering people and businesses, and international leadership and collaboration.

6.9 The Industrial Decarbonisation Strategy (2021) **[See reference** 272**]** aims to support existing industry to decarbonise and encourage the growth of new, low carbon industries to protect and create skilled jobs and businesses in the UK encouraging long-term investment in home-grown decarbonisation technology. The strategy builds in the Prime Minister's 10 Point Plan for a Green Industrial Revolution and sets out the government's vision for building a

competitive, greener future for the manufacturing and construction sector and is part of the government's path to net zero by 2050.

6.10 The strategy aims to reduce emissions by two-thirds in just 15 years and support up to 80,000 jobs over the next thirty years and includes measures to produce 20 terawatt hours of the UK industry's energy supply from low carbon alternatives by 2030. It also aims to introduce new rules on measuring the energy and carbon performance of the UK's largest commercial and industrial buildings, providing potential savings to businesses of around £2 billion per year in energy costs in 2030 and aiming to reduce annual carbon emissions by over 2 million tonnes – approximately 10% of their current emissions.

6.11 Other key commitments within the Strategy include:

- The use of carbon pricing to drive changes in industry to focus on emissions in business and investment decisions;
- To establish a policy framework to accelerate the switch from fossil fuels to low carbon alternatives such as hydrogen, electricity, or biomass;
- New product standards, enabling manufacturers to clearly distinguish their products from high carbon competitors;
- To ensure the land planning regime is fit for building low carbon infrastructure;
- Support the skills transition so that the UK workforce benefits from the creation of new green jobs;
- An expectation that at least 3 megatons of CO2 is captured within industry per year by 2030; and
- That by 2050, there will be zero avoidable waste of materials across heavy industries.

6.12 The **Heat and Buildings Strategy** (2021) **[See reference** 273**]** sets out the government's plan to significantly cut carbon emissions from the UK's 30 million homes and workplaces. This strategy aims to provide a clear direction of travel for the 2020s, set out the strategic decisions that need to be taken this

decade, and demonstrate how the UK plans to meet its carbon targets and remain on track for net zero by 2050.

6.13 Key aims of the strategy include:

- Reduce direct emissions from public sector buildings by 75% against a 2017 baseline by the end of carbon budget 6;
- Significantly reduce energy consumption of commercial, and industrial buildings by 2030;
- Phase out the installation of new natural gas boilers beyond 2035;
- Significantly grow the supply chain for heat pumps to 2028: from installing around 35,000 hydronic heat pumps a year to a minimum market capacity of 600,000 per year by 2028;
- Reduce the costs of installing a heat pump by at least 25-50% by 2025 and to ensure heat pumps are no more expensive to buy and run than gas boilers by 2030;
- Achieve 30-fold increase in heat pumps manufactured and sold within the UK by the end of the decade;
- Grow the market for heat pumps notably via a £450 million Boiler Upgrade Scheme to support households who want to switch with £5,000 grants;
- Improve heat pump appeal by continuing to invest in research and innovation, with the £60 million Net Zero Innovation Portfolio ‘Heat Pump Ready’ Programme supporting the development of innovation across the sector;
- Ensure all new buildings in England are ready for Net Zero from 2025. To enable this, new standards will be introduced through legislation to ensure new homes and buildings will be fitted with low-carbon heating and high levels of energy efficiency;
- Establish large-scale trials of hydrogen for heating, including a neighbourhood trial by 2023;
- Ensure as many fuel poor homes in England, as reasonably practicable, achieve a minimum energy efficiency rating of band C by the end of 2030;

- Support social housing, low income and fuel poor households via boosting funding for the Social Housing Decarbonisation Fund and Home Upgrade Grant, which aim to improve the energy performance of low income households' homes, support low carbon heat installations and build the green retrofitting sector to benefit all homeowners; and
- Scale up low-carbon heat network deployment and to enable local areas to deploy heat network zoning – Heat Network Transformation Programme of £338 million (over 2022/23 to 2024/25).

6.14 The **UK Hydrogen Strategy** (2021) **[See reference 274]** sets out the approach to developing a substantial low carbon hydrogen sector in the UK and to meet the ambition for 5GW of low carbon hydrogen production capacity by 2030.

6.15 The **Energy Performance of Buildings Regulations** (2021) **[See reference 275]** seek to improve the energy efficiency of buildings, reducing their carbon emissions and lessening the impact of climate change. The Regulations require the adoption of a standard methodology for calculating energy performance and minimum requirements for energy performance, reported through Energy Performance Certificates and Display Energy Certificates.

6.16 The **Energy White Paper: Powering our net zero future** (2020) **[See reference** 276**]** builds on the Prime Minister's Ten point plan for a green industrial revolution.

6.17 The white paper addresses the transformation of the UKs energy system, promoting high-skilled jobs and clean, resilient economic growth during its transition to net-zero emissions by 2050.

6.18 Key aims of the paper include:

- Supporting green jobs – The government aims to support up to 220,000 jobs in the next 10 years. Several will be supported via a "major

programme" that will see the retrofitting of homes for improved energy efficiency and clean heat.

- Transforming the energy system – To transform its electricity grid for net-zero, the white paper highlights how this will involve changing the way the country heats its homes, how people travel, doubling the electricity use, and harnessing renewable energy supplies.
- Keeping bills affordable – The government aims to do this by making the energy retail market "truly competitive". This will include offering people a method of switching to a cheaper energy tariff and testing automatically switching consumers to fairer deals to tackle "loyalty penalties".
- Generating emission-free electricity by 2050 – The government aims to have "overwhelmingly decarbonised power" in the 2030s in order to generate emission-free electricity by 2050.
- Establishing UK Emissions Trading Scheme – The government aims to establish a UK Emissions Trading Scheme (UK ETS) from 1 January 2021 to replace the current EU ETS at the end of the Brexit Transition Period.
- Exploring new nuclear financing options – The government is continuing to explore a range of financing options for new nuclear with developers including the Regulated Asset Base (RAB) funding model.
- Further commitments to offshore wind – The white paper lays out plans to scale up its offshore wind fleet to 40 gigawatts (GW) by 2030, including 1GW of floating wind, enough to power every home in the country.
- Carbon capture and storage investments – Including £1bn worth of investments in state-of-the-art CCS in four industrial clusters by 2030. With four low-carbon clusters set up by 2030, and at least one fully net-zero cluster by 2040.
- Kick-starting the hydrogen economy – The government plans to work with industry to aim for 5GW of production by 2030, backed up by a new £240m net-zero Hydrogen Fund for low-carbon hydrogen production.
- Investing in electric vehicle charge points – The government plans to invest £1.3bn to accelerate the rollout of charge points for electric vehicles

as well as up to £1bn to support the electrification of cars, including for the mass-production of the batteries needed for electric vehicles.

- Supporting the lowest paid with their bills – The government aims to support those with lower incomes through a £6.7bn package of measures that could save families in old inefficient homes up to £400. This includes extending the Warm Home Discount Scheme to 2026 to cover an extra three quarters of a million households and giving eligible households £150 off their electricity bills each winter.
- Moving away from fossil fuel boilers – The government aims, by the mid-2030s, for all newly installed heating systems to be low-carbon or to be appliances that it is confident can be converted to a clean fuel supply.
- Supporting North Sea oil and gas transition – The white paper notes the importance of supporting the North Sea oil and gas transition for the people and communities most affected by the move away from fossil fuels. The government aims to achieve this by ensuring that the expertise of the oil and gas sector be drawn on in developing CCS and hydrogen production to provide new green jobs for the future.

6.19 Flood and Coastal Erosion Risk Management: Policy Statement (2020) **[See reference 277]**: This policy statement sets out the government's long-term ambition to create a nation more resilient to future flood and coastal erosion risk, and in doing so, reduce the risk of harm to people, the environment and the economy. The Policy Statement sets out five policy areas which will drive this ambition. These are:

- Upgrading and expanding our national flood defences and infrastructure;
- Managing the flow of water more effectively;
- Harnessing the power of nature to reduce flood and coastal erosion risk and achieve multiple benefits;
- Better preparing our communities; and
- Enabling more resilient places through a catchment-based approach.

6.20 The **Flood and Water Management Act 2010** **[See reference 278]** and The **Flood and Water Regulations 2019** **[See reference 279]** sets out measures to ensure that risk from all sources of flooding is managed more effectively. This includes incorporating greater resilience measures into the design of new buildings; utilising the environment in order to reduce flooding; identifying areas suitable for inundation and water storage to reduce the risk of flooding elsewhere; rolling back development in coastal areas to avoid damage from flooding or coastal erosion; and creating sustainable drainage systems (SuDS).

6.21 A Green Future: Our 25 Year Plan to Improve the Environment **[See reference 280]:** Sets out goals for improving the environment within the next 25 years. It details how the Government will work with communities and businesses to leave the environment in a better state than it is presently. Actions relating to climate change are as follows:

- Using and managing land sustainably:
  - Take action to reduce the risk of harm from flooding and coastal erosion including greater use of natural flood management solutions.
- Protecting and improving our global environment:
  - Provide international leadership and lead by example in tackling climate change and protecting and improving international biodiversity.

6.22 The **National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting**: Making the country resilient to a changing climate **[See reference 281]**: Sets out visions for the following sectors:

- People and the Built Environment – “To promote the development of a healthy, equitable and resilient population, well placed to reduce the harmful health impacts of climate change...buildings and places (including built heritage) and the people who live and work in them are resilient and organisations in the built environment sector have an increased capacity to address the risks and make the most of the opportunities of a changing climate.”

- Infrastructure – “An infrastructure network that is resilient to today’s natural hazards and prepared for the future changing climate.”
- Natural Environment – “The natural environment, with diverse and healthy ecosystems, is resilient to climate change, able to accommodate change and valued for the adaptation services it provides.”
- Business and Industry – “UK businesses are resilient to extreme weather and prepared for future risks and opportunities from climate change.”
- Local Government – “Local Government plays a central role in leading and supporting local places to become more resilient to a range of future risks and to be prepared for the opportunities from a changing climate.”

6.23 UK Climate Change Risk Assessment 2017 **[See reference 282]**: Sets out six priority areas needing urgent further action over the next five years. These include:

- Flooding and coastal change risks to communities, businesses and infrastructure;
- Risks to health, well-being and productivity from high temperatures;
- Risks of shortages in the public water supply, and for agriculture, energy generation and industry, with impacts on freshwater ecology;
- Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity;
- Risks to domestic and international food production and trade; and
- New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals.

6.24 The **Energy Efficiency Strategy: The Energy Efficiency Opportunity in the UK** **[See reference 283]**: Aims to realise the wider energy efficiency potential that is available in the UK economy by maximising the potential of existing dwellings by implementing 21st century energy management initiatives on 19th century homes.

6.25 The **national flood and coastal erosion risk management strategy for England** **[See reference 284]**: This Strategy sets out the national framework for managing the risk of flooding and coastal erosion. It sets out the roles for risk management authorities and communities to help them understand their responsibilities. The strategic aims and objectives of the Strategy are to:

- Manage the risk to people and their property;
- Facilitate decision-making and action at the appropriate level – individual, community or Local Authority, river catchment, coastal cell or national; and
- Achieve environmental, social and economic benefits, consistent with the principles of sustainable development.

6.26 The **UK Low Carbon Transition Plan**: **National Strategy for Climate and Energy** (2009) **[See reference 285]**: sets out a five-point plan to tackle climate change. The points are as follows: protecting the public from immediate risk, preparing for the future, limiting the severity of future climate change through a new international climate agreement, building a low carbon UK and supporting individuals, communities and businesses to play their part.

6.27 The **UK Renewable Energy Strategy** **[See reference 286]**: Sets out the ways in which we will tackle climate change by reducing our CO_2 emissions through the generation of a renewable electricity, heat and transport technologies.

6.28 Climate Change Act 2008 **[See reference 287]**: Sets targets for UK greenhouse gas emission reductions of at least 100% by 2050, against a 1990 baseline (this was previously 80% but was updated to a net zero target in June 2019).

6.29 Planning and Energy Act 2008 **[See reference 288]**: enables local planning authorities to set requirements for carbon reduction and renewable energy provision. It should be noted that while the Housing Standards Review proposed to repeal some of these provisions, at the time of writing there have been no amendments to the Planning and Energy Act.

Regional and local

6.30 Thames Estuary 2100 [See reference 289]: The document sets out the Environment Agency's recommendations for flood risk management for London and the Thames Estuary through to the end of the century and beyond. The Plan sets out the future shape of flood risk management, strategic action that is needed and options to achieve this, local actions that are needed, and how the impact of rising sea levels needs to be addressed. Action Zones 5, 6, 7and 8 covers the sub-region. Actions have been identified which include hard and soft measures including a floodplain management programme, partnership arrangements to ensure that new development is safe, review and maintain future partnership arrangements and principles and management of defences.

6.31 The Thames Estuary 2100 Plan includes policy recommendations for public realm and access improvements, coinciding with other initiatives such as the Thames Gateway Parklands vision, which envisages improved access and connections with local communities. The Plan introduces the riverside strategy approach. This integrates improvements to flood risk management defences into wider redevelopment, enhancing the social, environmental and commercial aspects of the riverside.

6.32 The Plan is also an example of a managed adaptive strategy approach for varying rates of climate change, which is made up of a combination of different interventions that act together to achieve the recommended policy.

6.33 South East Inshore Marine Plan [See reference 290]: The Plan introduces a strategic approach to planning within the inshore waters between Suffolk and Kent, including the Thames Estuary. This includes building resilience and adaptations to climate change, as well as consideration of renewable energy and potential for carbon capture and storage.

6.34 Essex Transport Strategy [See reference 291]: The Essex Transport Strategy outlines the County Council's priorities and strategic objectives for improving the transport network across Essex, including by encouraging a

modal shift towards public transport, walking and cycling over single occupancy car journeys. The Plan supports the use of cleaner, lower carbon transport technologies, and car share schemes.

6.35 Sustainable Modes of Travel Strategy [See reference 292]: The Sustainable Modes of Travel Strategy aims to reduce the number of private vehicles using the highway network and increase the use of more active and sustainable modes available to businesses, residents and schools within Essex. A key objective is to manage congestion during peak times and improve the environment by reducing the need to travel by car and potentially reducing CO_2 and other emissions.

6.36 Transport East Active Travel Strategy [See reference 293]: The vision for the region is that half of all journeys within towns and cities (up to three miles from the urban centre) will be made by walking and cycling. By 2050, half of all trips in the Transport East region will be made by walking or cycling. In Thurrock, a “Go Dutch” scenario (which applies Dutch rates for cycle commuting in England adjusting for distance and hilliness) would result in almost a twelve-fold increase of the population who could commute to work by cycle, to 24.9%.

6.37 Transport East Draft Transport Strategy [See reference 294]: The Draft Transport Strategy aims to outline a collective vision for the future of transport in the region and set out key investment priorities needed to deliver it. The overarching vision is underpinned by four strategic priorities: decarbonisation to net-zero, connecting growing towns and cities, energising coastal and rural communities, and unlocking international gateways. The four strategic priorities overlap and together form an integrated strategy for the region. The Draft Transport Strategy sets out the pathways and key goals needed for the delivery of their Vision, which include goals focused around improving sustainable and active travel options, reducing demand for travel via digital connectivity, encouraging behaviour change, increasing access for coastal and rural communities, improving efficiency of freight transport, and creating better connected ports and airports to unlock international gateways.

6.38 Section 5 of the Draft Transport Strategy highlights place-based strategic corridors which link key destinations with the region. For Thurrock, this includes improved links with South Essex, London, Basildon and Southend. The Strategy identifies the area as a major location for economic growth, particularly in relation to the major international ports at London Gateway, Purfleet and Tilbury (now Thames Freeport). At present, the area is heavily congested which acts as a major barrier to growth. The Strategy identifies the need for improved road, freight capacity, passenger rail and bus networks to support economic and population growth in the region.

6.39 Thurrock Climate Change Scoping Study [See reference 295**]**: The Thurrock Climate Change Scoping Study was commissioned in 2019 to inform the integration of climate change into the Council's planning policy, in accordance with NPPF. The study's aims are to provide a baseline assessment of the Borough's current climate impacts (emissions) and risks (hazards); summarise existing climate change legislation and policy; review existing documents, local plan processes, policy and operation; outline initiatives to focus on in the Local Plan; and to define what the requirements should be if a climate change strategy were to be developed for the Borough. The study provides a series of recommendations and next steps for the process including stakeholder engagement and establishing timescales and accountability. It also highlights core focus areas and priorities for the Borough including land-use and access issues, carbon emissions relating to buildings, retail and industry, infrastructure, natural resources, the environment and waste.

6.40 Thames Estuary Hydrogen Investment Routemap [See reference 296**]**: The routemap aims for the Thames Estuary, including the section within Thurrock, to become a "hydrogen ecosystem", highlighting that the Estuary is uniquely placed to support and realise the governments hydrogen ambitions.

6.41 Draft Thurrock Transport Strategy (internal draft, currently unpublished): The Interim Draft Transport Strategy builds on the existing Transport Strategy (2013 – 2026), taking into account much of the rapid change Thurrock is undergoing, including major regeneration projects and proposed development which will fundamentally alter the way people and goods move around Thurrock and the wider region over the next 20 years. Key projects include Grays Town

Centre regeneration, the port expansion of Tilbury and London Gateway, proposed development of a logistics 'superhub' at Thames Enterprise Park, the Thames Freeport, Purfleet regeneration, and the proposed construction of the Lower Thames Crossing (LTC). The Draft Transport Strategy outlines key challenges and opportunities for Thurrock which include supporting sustainable economic growth, supporting the health and wellbeing of Thurrock's residents and addressing the Climate Emergency. These factors inform the Transport Vision Statement ('Connecting Thurrock'), as well as 10 interconnected overarching goals and nine strategic focus areas specified in the Draft Transport Strategy. The Draft Transport Strategy will be supported by a series of shorter-term delivery documents, setting out more specific actions that aim to achieve the overarching vision and goals.

6.42 Thurrock Transport Strategy 2013-2026 [See reference 297]: The strategy sets out the aims, objectives and policies for delivering transport improvements in Thurrock, including (but not limited to) to respond to large scale growth at Lakeside, Tilbury Port and London Gateway. The strategy focusses on the need to address the following key areas: Delivering Accessibility, Tackling Congestion, Improving Air Quality and Addressing Climate Change, Safer Roads and Facilitating Regeneration. This strategy also sets out the long-term approach to walking and cycling in the Borough.

6.43 Thurrock Local Flood Risk Management Strategy [See reference 298]: This strategy sets out how Thurrock Council, alongside other Risk Management Authorities (RMAs), are responding to identified flood risk in Thurrock. Among other things, the strategy specifies the flood and coastal erosion risk management functions that may be exercised by RMAs, objectives and measures for managing local flood risk and implementation details for these.

6.44 Thurrock Council Level 1 Strategic Flood Risk Assessment [See reference 299]: The SFRA provides an overview of flood risk from all sources across Thurrock. It identified the tidal and fluvial flood plains associated with the River Thames, main rivers and some ordinary watercourses. A revised Level 2 SFRA will be produced in the near future.

6.45 South Essex Green and Blue Infrastructure Strategy: Resilient by Nature [See reference 300]: This strategy sets out a vision for and integrated green and blue infrastructure (GBI) network across South Essex and sets out key objectives and projects to achieve this. This includes the protection and enhancement of GBI throughout the region to mitigate and adapt to the effects of climate change.

6.46 Green Essex Strategy [See reference 301]: This Strategy seeks to enhance, protect and create an inclusive and integrated network of high-quality green infrastructure in Greater Essex, to create a county-wide understanding of green infrastructure – its functions and values, and to identify opportunities for implementing green infrastructure. The Strategy recognises the importance of GI in terms of environmental benefits, including climate change mitigation and adaptation. The Strategy highlights the importance of GI in providing ecological networks of all scales, from regional to neighbourhood scale.

6.47 As part of the preparation of the Local Plan, Thurrock Council is currently preparing a **Climate Change Strategy**, **Energy Strategy, Transport Strategy**, **Level 2 Strategic Flood Risk Assessment**, and **Green and Blue Infrastructure Strategy** which will be taken into account in the next iteration of the IIA.

Implications of the policy review for the Local Plan and IIA

In order to align with the international, national, regional and local policies outlined above, the Local Plan should seek to ensure that new development reduces carbon emissions, is energy efficient, and promotes the use of renewable energy sources and sustainable construction methods and materials. The Local Plan should encourage new development to be designed to adapt to climate change for the increased likelihood of extreme weather events including overheating as a result of temperature rise. The

Local Plan should also seek to ensure that risk from all sources of flooding as a result of climate change is managed effectively and ensure that development is resilient to future flooding, as well as improve the transport network across the Plan area including by encouraging a modal shift towards public transport, walking and cycling, and reduce the need to travel by car. The IIA is able to respond to this through the inclusion of IIA objectives relating to the mitigation of climate change and adaptation to climate change, sustainable construction, flooding and sustainable transport.

Baseline information

Climate change predictions

Current baseline information

6.48 Climate change presents a global risk, with a range of different impacts that are likely to be felt within Thurrock across numerous receptors. The Intergovernmental Panel on Climate Change (IPCC) special report on global warming outlines that, under emissions in line with current pledges under the Paris Agreement, **global warming is expected to surpass 1.5°C**, even is these pledges are supplemented with very challenging increases in the scale and ambition of mitigation after 2030. This increased action would need to achieve net zero CO_2 emissions in less than 15 years **[See reference** 302**]**.

6.49 In light of the IPCC work, Thurrock Council declared a Climate Emergency in October 2019. With this, the Council has committed to reduce its net CO_2 emissions to zero by 2030. Carbon neutrality, therefore, needs to be fully woven into the new Local Plan and key part of the IIA process. A Climate Change Partnership Group has now been established in Thurrock. This group is tasked

with determining how and when the Council can achieve net zero carbon emissions, as well as how to best leverage the benefits of climate action for other socio-economic goals, leading to the development of targets, pathways, and an action plan for Thurrock to reduce its greenhouse gas emissions in line with the UK's net zero goal **[See reference** 303**]**.

6.50 Thurrock Council Climate Change Scoping Study highlighted that Thurrock Council is positioned well to integrate climate priorities in its plans as it is a unitary authority. But that because climate issues are transboundary it will be crucial for the borough to be cooperative across sectors, stakeholders and the public. The study also notes that this level of cooperation could be aided in part by its membership in the Association of South Essex Local Authorities (ASELA) **[See reference** 304**]**.

Projected baseline information

6.51 The Tyndall Centre for Climate Change Research **[See reference** 305**]** has undertaken work to calculate the 'fair' contribution of local authorities towards the Paris Climate Change Agreement. Based on the analysis undertaken the following recommendations have been made for Thurrock:

- The Borough should stay within a maximum cumulative carbon dioxide emissions budget of 5.5 million tonnes ($MtCO_2$) for the period of 2020 to 2100. It should be noted that at 2017 carbon dioxide emission levels, Thurrock would use this entire budget within seven years from 2020;
- The Borough should also initiate an immediate programme of carbon dioxide mitigation to deliver cuts in emissions averaging a minimum of -12.9% per year to secure a Paris aligned carbon budget; and
- The Borough should reach zero or near zero carbon no later than 2042.

6.52 In general, climate change projections (through UK Climate Projections) indicate a greater chance of hotter, drier summers and warmer, wetter winters in the UK **[See reference** 306**]**. The UK has experienced a general trend towards warmer average temperatures in recent years with the most recent

decade (2009–2018) being on average 0.3C warmer than the 1981–2010 average and 0.9C warmer than 1961–1990. The 21st century is reported so far as being warmer than the previous three centuries.

6.53 Heavy rainfall and flooding events have been demonstrated to have increased potential to occur in the UK as the climate has generally become wetter. For example, the highest rainfall totals over a five-day period are 4% higher during the most recent decade (2008-2017) compared to 1961-1990. Furthermore, the amount of rain from extremely wet days has increased by 17% when comparing the same time periods. In addition, there is a slight increase in the longest sequence of consecutive wet days for the UK.

6.54 UK Climate Projections 18 (UKCP18) for the East of England identify the following main changes (relative to 1981-2000) to the climate by the end of the plan period (2038) **[See reference** 307**]**:

- Increase in mean winter temperature by 1.0°C;
- Increase in mean summer temperature by 1.2°C;
- Increase in mean winter precipitation by 5.0%; and
- Decrease in mean summer precipitation by 10.0%.

6.55 The UK Climate Risk Independent Assessment (CCEA3) identifies a set of 61 specific risks and opportunities to the UK from climate change, some of which are as follows **[See reference** 308**]**:

Risks

- The number of incidents of food poisoning, heat stress and heat related deaths may increase in summer.
- Domestic energy use may increase during summer months as refrigeration and air conditioning demand increases.
- Wetter winters and more intense rainfall events throughout the year may result in a higher risk of flooding from rivers.

- More intense rainstorms may in some locations result in the amount of surface water runoff exceeding the capacity of drainage systems, consequently leading to more frequent and severe localised flash flooding.
- More frequent storms and floods may cause increased damage to property and infrastructure, resulting in significant economic costs.
- Periods of drought in summer could lead to soil shrinking and subsidence, causing damage to buildings and transport networks. Drought may also impact negatively on agriculture, industry and biodiversity.
- Warmer and drier summers are likely to affect the quantity and quality of water supply, which will need careful management.
- The changing climate will impact on the behaviour and distribution of species and may encourage the spread of invasive species.

Opportunities

- Milder winters should reduce the costs of heating homes and other buildings, helping to alleviate fuel poverty and reducing the number of winter deaths from cold.
- Domestic energy use may decrease in winter due to higher temperatures.
- Warmer and drier summers may benefit the recreation and tourism economy.
- UK agriculture and forestry may be able to increase production with warmer weather and longer growing seasons.

Emissions and energy

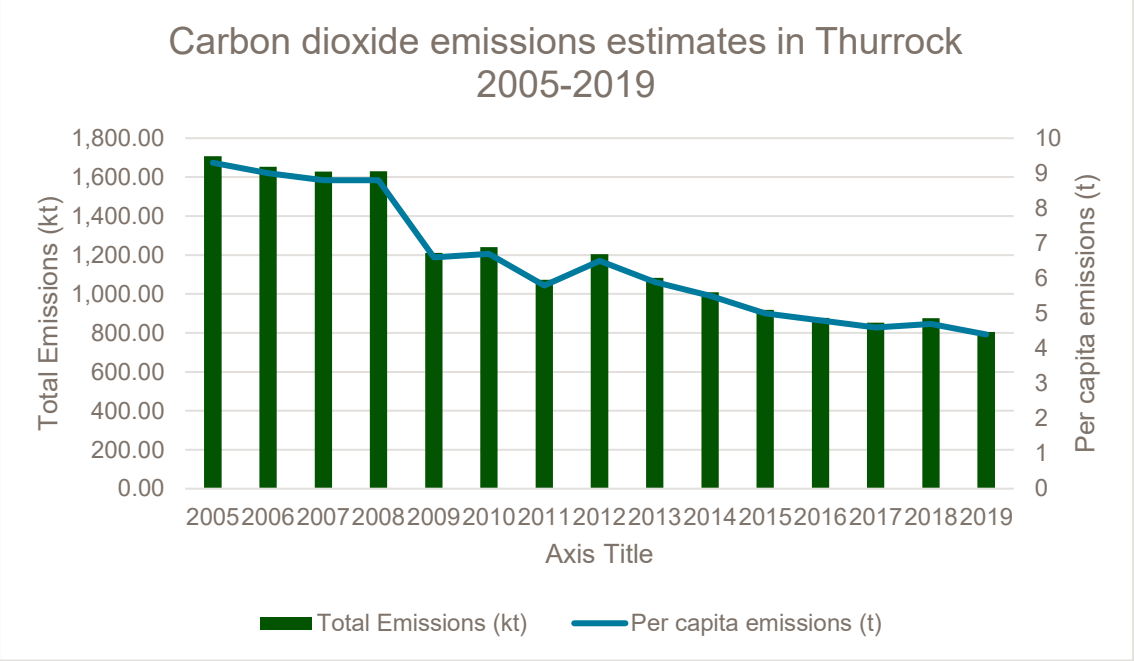
Current baseline information

6.56 In recent years, in line with the UK as a whole, the East of England has seen a decrease in carbon dioxide emissions. One of the main drivers for reduced levels of emissions has been a decrease in the use of coal for electricity generation, accounting for a decrease in emissions for domestic electricity.

6.57 In the East of England, carbon dioxide emissions have fallen from 8.7t per capita to 5.4t per capita (equivalent to a 38% reduction) from 2005 to 2019. Emissions for Thurrock are now similar to those of East of England falling steadily from 12.7t per capita to 5.3t per capita over the same period, with the exception of 2010, 2012 and 2018 where emissions rose slightly.

6.58 However, this rate of decrease has been more dramatic in Thurrock compared to East of England statistics, this is also despite the Borough's population increasing by 17% in this period from 148,600 to 174,300. Per capita emissions in the plan area within the scope of influence of the local authority fell most years between 2005 and 2019 as shown in Figure 6.1 **[See reference 309]**.

Figure 6.1: Carbon dioxide emissions estimates in Thurrock 2005-2019



6.59 Although industry was the biggest contributor of CO_2 emissions in 2005, this sector has seen the largest decrease of total CO_2 emissions which is likely due to decline in heavy industry and the closure of Tilbury Power Station **[See reference** 310**]**. In 2019 transport was the biggest contributor to CO_2 emissions in Thurrock as shown in Table 6.1 **[See reference 311]**.

Table 6.1: Changes in carbon dioxide emissions by sector for the region and Borough between 2005 and 2019

Source of Emissions (kt)	East England – 2005	East England – 2019	Thurrock – 2005	Thurrock – 2019
Industry	8,983.6	5,242.7	607.1	152.4
Commercial	6,040.4	2,725.5	396.7	109.3
Public Sector	1,966.5	959.1	89.4	27.2

Source of Emissions (kt)	East England – 2005	East England – 2019	Thurrock – 2005	Thurrock – 2019
Domestic	14,068.5	8,678.9	333.1	198.8
Transport	14,360.7	13,513.9	471.7	436.7
Grand Total	**48,439.7**	**33,932.8**	**1,893.3**	**916.3**

6.60 Figure 6.2 shows the per capita carbon dioxide emissions for Thurrock compared to the surrounding.

LUC

Figure 6.2: Per Capita CO2 Emissions

Thurrock Council boundary

Neighbouring authority boundary

CO2 emissions per capita (tonnes) - 2019

- 38
- 39 - 76
- 77 - 105
- 106 - 114
- 115 - 184
- 185 - 263
- 264 - 269
- 270 - 370

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG6_1_6999_CO2_A3L 26/04/2022
Source:LUC, TC, DEFRA, ONS

THURROCK COUNCIL

Energy consumption and generation

6.61 The Department for Business, Energy & Industrial Strategy produced the following consumption figures for Thurrock in 2019 **[See reference** 312**]** (see Table 6.2):

- Coal – A total of 0.8ktoe (thousands of tonnes of oil equivalent) predominantly through domestic use.
- Manufactured fuels – A total of 0.5ktoe predominantly through domestic use.
- Petroleum – A total of 144.7ktoe predominantly from road transport.
- Gas – A total of 114.9ktoe predominantly through domestic use.
- Electricity – A total of 82.6ktoe predominantly through industrial and commercial use.
- Bioenergy and wastes – A total of 12.3ktoe, predominantly through road transport.

6.62 Between 2005 and 2019 the total reported energy consumption for the Borough fell from 1,331.8ktoe to 355.9ktoe. The changes in consumption by energy type are shown in Table 6.2. With the exception of energy from biomass and wastes, the consumption of all energy types fell during the same period.**[See reference 313]**.

Table 6.2: Energy consumption in Thurrock by type

Energy Type	Energy Consumption in ktoe (2005)	Energy Consumption in ktoe (2019)
Coal	20.6	0.8
Manufactured fuels	139.8	0.5
Petroleum	740.2	144.7
Gas	330.7	114.9

Energy Type	Energy Consumption in ktoe (2005)	Energy Consumption in ktoe (2019)
Electricity	97.5	82.6
Bioenergy and wastes	2.9	12.3
Total	**1,331.8**	**355.9**

6.63 Thurrock has increased its capacity to generate electricity from renewable sources from 2014 to 2020 from 68.6MW installed capacity to 112.84MW installed capacity. Capacity for solar power, onshore wind and plant biomass has accounted for the majority of installed renewable energy capacity in Thurrock during this period. Plant biomass saw the largest increase in this time from 0MW to 41.14MW, the largest share of installed capacity. Landfill gas also makes up a significant portion of capacity, however this decreased slightly in this period from 43.7MW to 39.8MW. Energy generation from renewable sources also increased during this period from 267,104MWh in 2014 to 412,409.07MWh.

6.64 Considering the year-on-year trend of renewable electricity generation in Thurrock the 2020 figure was an increase on the 2019 figure of 69,131MWh. This is almost two times more than the increase in renewable energy generation experienced across the UK and England which grew by 20% and 12.6% from 2019 to 2020, respectively **[See reference** 314**]**.

Road travel and associated energy consumption

6.65 Carbon emissions for the UK in 2020 fell by 10.7% from 2019 levels. Despite a 12% decrease from the previous year due to the impacts of COVID-19, in 2020 transport was still the largest source of carbon dioxide in the UK, accounting for 29.8% of total emissions. The majority of emissions from transport in the UK are from road transport **[See reference** 315**]**.

6.66 Thurrock benefits from good transport and connectivity to the wider Essex region, Kent, east and central London, and international destinations via the

Port of Tilbury. The Borough is served by significant road transport networks, included being intersected by two of the country's busiest major roads, the M25 and A13 **[See reference** 316**]**.

6.67 As of 2011, out of a population of 158,000, 43,076 Thurrock residents lived and worked in Thurrock and 31,956 commuted to other areas for work. At this time, 18,141 people worked in Thurrock but commuted from other areas. The significant proportion of Thurrock residents that out-commute for work is due in particular to the Borough's close proximity to the capital and may also be contributed to by rising house and office prices pushing people out of London **[See reference** 317**]**. As of 2011, 34.3% of Thurrock residents commuted to London on a daily basis, mainly by car **[See reference** 318**]**. Though more recent data is not available, it is likely that COVID-19 has significantly impacted commuter numbers in recent years.

6.68 As seen in Table 6.3, as of 2011, out of a total of 114,124 Thurrock residents, the most popular mode of transport to travel to work was by car or van (41%), followed by the train (11%) and walking (4%). A similar picture was seen in the East of England, where out of 4,245,544 residents, 1,757,121 (41%) drove a car or van to work, 288,663 (7%) walked and 205,077 (5%) took the train **[See reference** 319**]**.

Table 6.3: Method of travel to work by residents in East of England and Thurrock (2011)

Method of Travel to Work	East of England	Thurrock
All categories	4,245,544	114,124
Work mainly at or from home	161,428	2,258
Underground, metro, light rail, tram	33,110	1,392
Train	205,077	11,992
Bus, minibus or coach	106,303	2,892
Taxi	13,227	484

Method of Travel to Work	East of England	Thurrock
Motorcycle, scooter or moped	22,475	797
Driving a car or van	1,757,121	47,281
Passenger in a car or van	143,749	4,234
Bicycle	100,651	1,097
On foot	288,663	4,588
Other method of travel to work	17,708	405
Not in employment	1,396,032	36,704

6.69 The areas of Havering (3,674 commuters), Basildon (3,470 commuters), Castle Point (1,638 commuters), Barking and Dagenham (1,396 commuters) and Southend-on-Sea (1,192 commuters) account for the largest inflows of commuters to Thurrock (see Figure 6.3). The areas of Basildon (2,943 commuters), Havering (2,693 commuters), Castle Point (1,446 commuters) and Southend-on-Sea (971 commuters) account for the largest numbers of people travelling to the Borough for work by car or van.

6.70 Large numbers of commuters (many by car or van) travel out of Thurrock to Basildon (5,310 commuters, 4,295 by car or van), Westminster, City of London (5,265 commuters, 516 by car or van), Havering (3,429 commuters, 2,775 by car or van) and Tower Hamlets (2,630 commuters, 974 by car or van) (see Figure 6.4) **[See reference** 320**]**.

Figure 6.3: Flows of commuters in and out of the Borough (total)

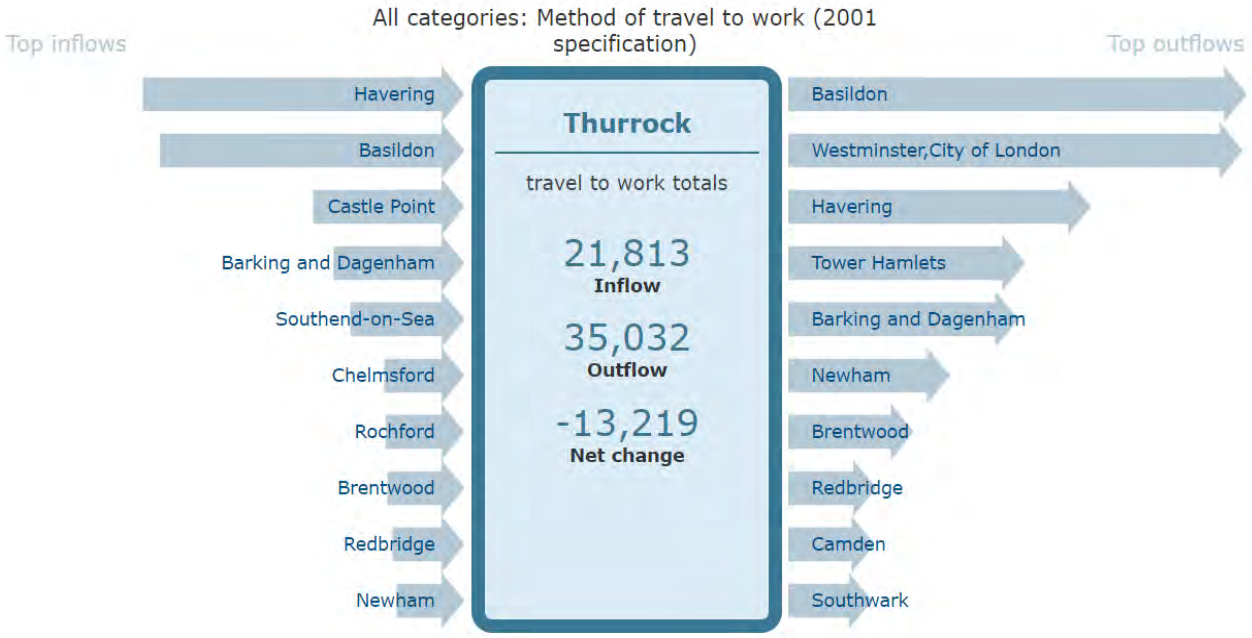
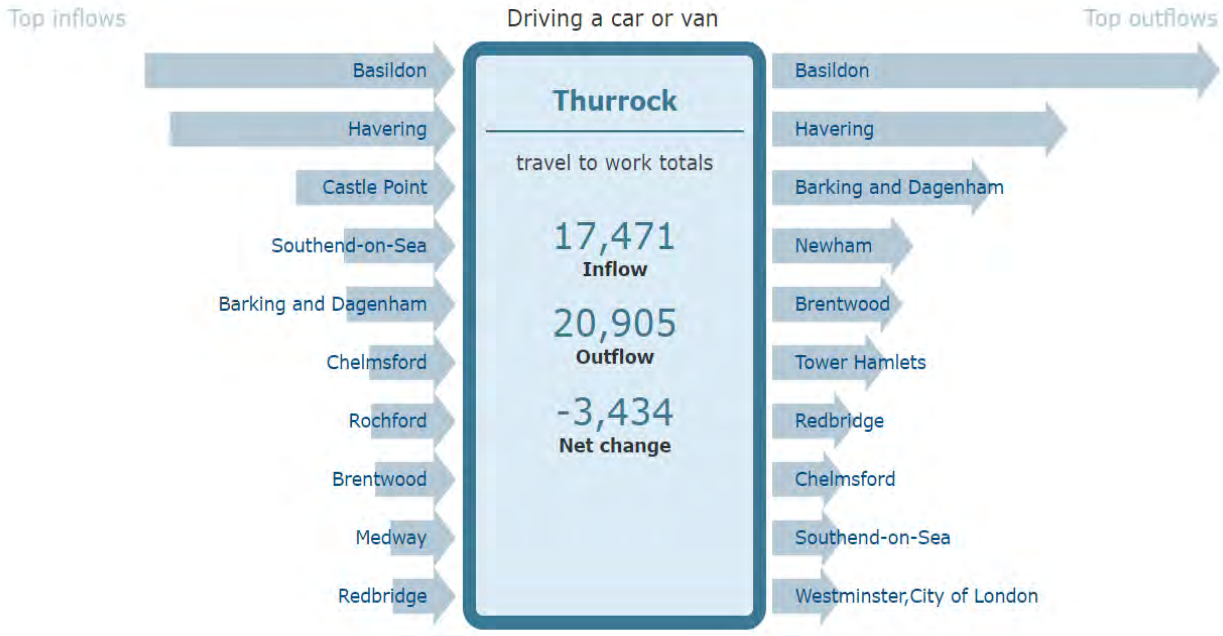


Figure 6.4: Flows of commuters in and out of the Borough (by car or van)



6.71 Road transport accounts for more than half of oil demand in the UK and relies on petrol and diesel to meet around 98% cent of its energy needs. This has implications for carbon emissions considering the regular need to travel for both residents and those undertaking business.

6.72 The overall road energy consumption in Thurrock decreased between 2005 and 2019 from 136,398t of equivalent oil to 141,985t of equivalent oil. This change was most influenced by the decreasing energy consumption for personal road travel which fell during this period from 79,795t of equivalent oil to 73,615t of equivalent oil. During this period energy consumption recorded in Thurrock for freight uses actually rose from 56,603t of equivalent oil to 68,370t of equivalent oil **[See reference** 321**]**.

6.73 Recent trends across the UK indicate that diesel consumption excluding biodiesel fell in 2018 for the first time since 2009. The trend is due in part to a slowing of growth in the diesel vehicle fleet following sharp drops in new registrations as well as increased efficiencies. It is expected that the UK will diversify in road transport to include more electric and ultra low emissions vehicles in the coming years **[See reference** 322**]**.

6.74 As of January 2022, there were 28,375 public electric vehicle charging devices available in the UK and of these, 5,156 were rapid charging devices. Within Thurrock there are a total of 18 public electric vehicle charging devices and 11 of these are rapid charging devices. There are approximately 10 charging devices per 100,000 population. The Borough performs worse than the UK average of 42.3 charging devices per 100,000 population. Thurrock is within the bottom 20% of local authorities in terms of this measure **[See reference** 323**] [See reference** 324**]**.

Projected baseline information

6.75 Given the trends in carbon emissions and energy consumption at both national and local level, carbon emissions in Thurrock are likely to continue declining and trends in renewable energy generation indicate future growth in

the sector. However, growth in traffic levels, largely as a result of ongoing development, is a continuing long-term trend in Thurrock. This means that the difference between Thurrock's per capita road transport emissions and the national average is likely to continue widening. This could conflict with Thurrock's attempts to meet its carbon emission targets.

Flood risk

Current baseline information

6.76 Flood risk in the Borough is implicitly linked to climate change considering the changes predicted in weather patterns and the impact this will have on sea level rise and subsidence, both of which could lead to more frequent flooding in Thurrock. According to UK Climate Change Projections made in 2018, the East of England region including Thurrock is predicted to experience an increase in winter rainfall of 5% and a decrease in summer rainfall of 10% by 2038 **[See reference** 325**]**.

6.77 Thurrock is affected by flooding from several sources: tidal, fluvial, surface water, ordinary watercourses, sewer and groundwater (see Figure 6.5). Tidal and fluvial sources are likely to be the main risk of future flooding in Thurrock, particularly from high tidal water levels in the Thames Estuary and in the north of the Borough from the River Mardyke from storm surges coupled with high spring tides. Flooding has been an issue in Thurrock, especially in recent years, with large areas of the Borough located within flood risk zones 2 and 3, especially in areas immediately adjacent to the River Thames and along the River Mardyke **[See reference** 326**]**. Approximately 11,000 properties in Thurrock are estimated to currently be at risk of tidal flooding, and several hundred at risk of fluvial flooding, particularly in the areas of Tilbury, Purfleet and West Thurrock. Other areas vulnerable to flooding include commercial and industrial developments such as the Port of Tilbury, DP World London ports, Lakeside Retail Park, and transport assets including the c2c mainline, the A13 and the Thames Lower Crossing **[See reference** 327**]**.

6.78 Surface water flood risk is widespread across Thurrock, with the highest risk located in the more urbanised areas, with Stanford-Le-Hope and parts of Grays expected to see the largest amounts of surface water flooding in an extreme rainfall event **[See reference** 328**]**.

6.79 There are currently a number of flood defences in place, including the Thames Barrier, which is located seven kilometres upstream from Thurrock, and concrete seawalls that protect Thurrock from tidal floods that occur once every 1,000 years. The present defence height along the Thurrock foreshore, according to the Environment Agency, varies between 6.9m AOD (above ordnance datum) and 7.2m AOD. This provision roughly resembles the 1 in 1,000-year peak tide range for the year 2109. A large flood storage area to the north of Tilbury town strategically protects the town from pluvial run-off coming from higher ground to the north **[See reference** 329**]**.

Projected baseline information

6.80 As previously outlined in the 'Climate Change Predictions' section of this chapter, the climate in Thurrock is expected to change, presenting a series of risks for the Borough. These include wetter winters, more intense rainfall events and more frequent storms and floods, leading to increased damage to property and infrastructure and significant economic costs.

6.81 Due to the geography of the Borough, flooding (including flash, fluvial and tidal flooding) is one of the greatest risks to Thurrock from climate change. Climate change will likely result in sea level rise and subsidence which could lead to more frequent flooding in Thurrock and impact communities, businesses and local authority services in coastal areas. Additionally, incidences of heavy rainfall are expected to continue to rise and will present challenges in terms of drainage and flood risk.

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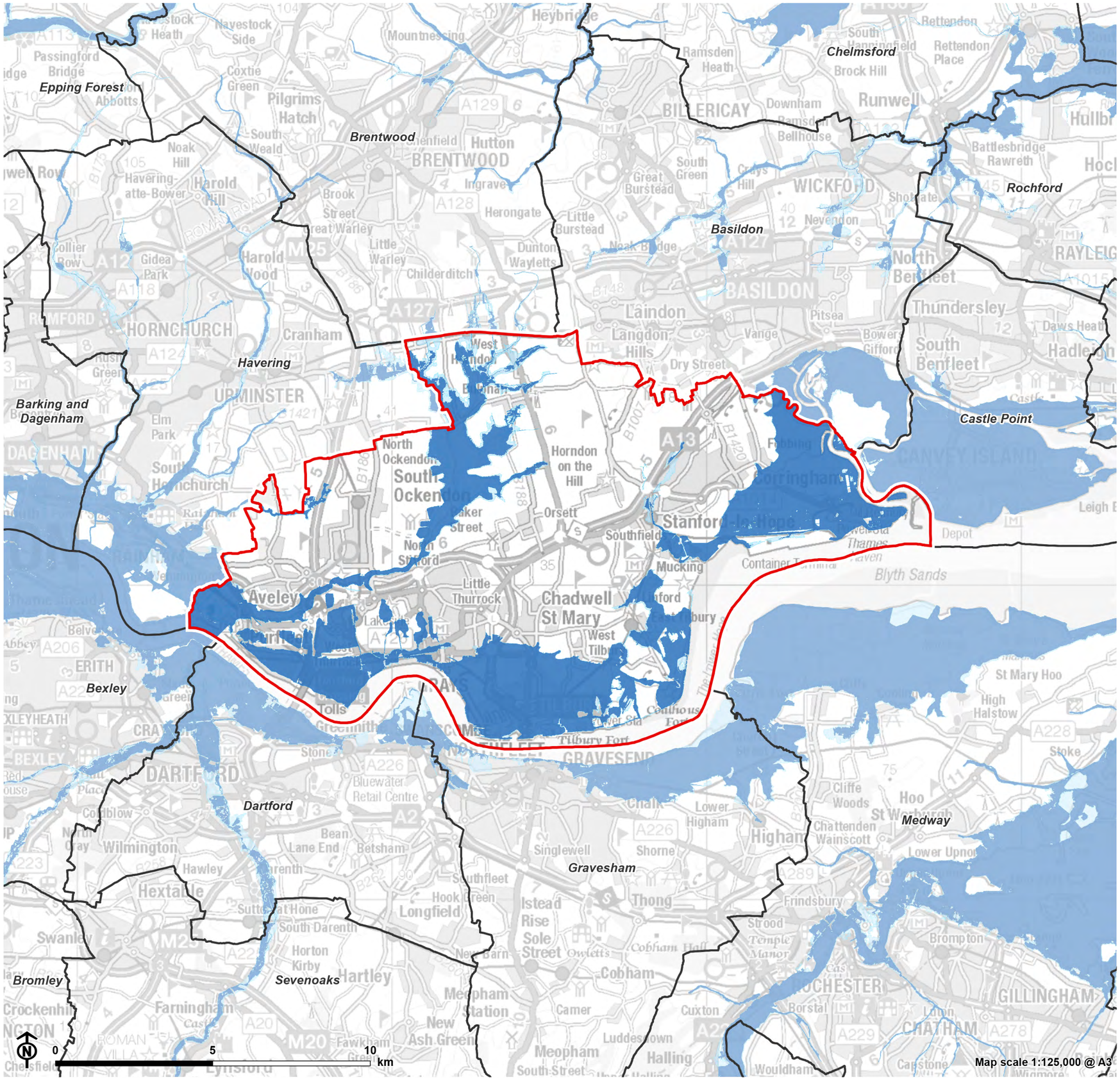
Figure 6.5: Flood Risk



CB:AHB EB:Tomlinson_J LUC FIG6_4_6999_Flood_A3L 26/04/2022
Source:LUC, TC, EA

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Implications for health

6.82 Climate change has potential for substantial implications on human health, including:

- Disruption to health, social care and emergency management services and schools provision, from flooding, heatwaves and storms.
- Flooding poses multiple risks to people's health, such as heart attacks, trauma, an increase in waterborne infectious diseases, and common mental and post-traumatic stress disorders. Damp housing and damage to water and sanitation infrastructure can further reinforce the adverse effects on health.
- Climate change may bring increase in both cold weather excess mortality and heat-related deaths and illness occurring in the summer. Excess heat represents a serious threat for the entire population, but the elderly and small children, and people with pre-existing cardiovascular, respiratory and renal diseases, diabetes and neurological disorders, are more susceptible. Prolonged periods (at least three days) of extremely high air temperatures, called heatwaves, directly affect people's health and an increase in the daily mortality rate is the major measurable impact of a heatwave. Urban areas tend to be at greater risk due to the "urban heat island" effect. The number of excess deaths in England resulting from heatwaves in 2020 was 2,556. Cumulative excess deaths resulting from heatwaves in summer 2020 was the highest recorded on record since the heatwave plan for England was introduced **[See reference** 330**]**.
- Cases of food poisoning in the UK that are linked to warm weather have been increasing rapidly.
- Wildfire likelihood and severity set to increase due to climate change.
- The likely increase in occurrence of severe winter gales is a cause for concern. Deaths during severe gales are commonplace, as are severe injuries. The likely loss of electrical power supplies during severe storms adds very significantly to these problems. Better forecasting of gales and better design and more frequent exercising of disaster plans may well help to mitigate the worst effects.

Key sustainability issues and likely evolution of these issues without the Local Plan

6.83 There is a need to significantly reduce the Borough's greenhouse gas emissions to help meet international and national greenhouse gas reduction targets. This can be achieved through:

- Reducing journeys by private car. Transport is the largest contributor to carbon dioxide emissions in Thurrock. However, this will be challenging due to its intersection by significant road transport networks and given current levels of in and out commuting by car, primarily commuting to Basildon to the east and towards London to the west (Basildon, Havering, Barking and Dagenham, and Newham).
- Increasing generation of low carbon and renewable energy sources. Thurrock's current renewable electricity generation is almost twice the UK average, however the Borough is within the bottom 20% of local authorities in terms of electric vehicle charging device provision.
- Encouraging energy efficiency measures in new and existing buildings.

6.84 The effects of climate change in the Borough are likely to result in extreme weather events (e.g., intense rainfall and flooding, prolonged high temperatures and drought) becoming more common and more intense. Of prominence to Thurrock is increasing flood risk, especially in the urbanised south of the borough by the River Thames, and also increasing heatwaves and droughts in the summer. Climate change is therefore likely to affect habitats and species and how people live, work and play. Opportunities exist for nature-based solutions such as carbon sequestration, flood retention, shading etc.

6.85 Climate change and flooding will adversely affect Thurrock with or without the Local Plan. However, the Local Plan provides an opportunity to adapt and mitigate to climatic factors by promoting sustainable development, for example by locating development in sustainable locations that would not be significantly

impacted by flooding and ensuring it is designed to be flood resilient; reducing the need to travel; use of green infrastructure; and through encouraging low carbon design, promotion of renewable energy and sustainable transport.

Chapter 7
Biodiversity

Policy context

International

7.1 United Nations Declaration on Forests and Land Use (COP26 Declaration) (2021) **[See reference 331]**: international commitment to halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation.

7.2 The **2030 Agenda for Sustainable Development** (2015) **[See reference 332]**: This initiative, adopted by all United Nations Member States, provides a shared blueprint for peace and prosperity for people and the planet and includes 17 Sustainable Development Goals (SDGs), designed to achieve a better and more sustainable future for all. Relevant to this topic are:

- SDG 13: Climate Action
- SDG 14: Life Below Water
- SDG 15: Life on Land

7.3 International Convention on Biological Diversity (1992) **[See reference 333]**: International commitment to biodiversity conservation through national strategies and action plans.

7.4 European Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (1979) **[See reference 334]**: Aims to ensure conservation and protection of wild plant and animal species and their

natural habitats, to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species).

7.5 International Convention on Wetlands (Ramsar Convention) (1976) **[See reference 335]**: International agreement with the aim of conserving and managing the use of wetlands and their resources.

National

7.6 A requirement of the **NPPF's** (2021) **[See reference 336]** environmental objective is that the planning system should contribute to protecting and enhancing the natural environment including helping to improve biodiversity and using natural resources prudently. In support of this aim the framework states that Local Plans should "identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks" and should also "promote the conservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity".

7.7 The framework requires that plans should take a strategic approach in terms of "maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries".

7.8 The NPPF is supported by planning practice guidance relating to:

- **Natural environment** (2019) **[See reference 337]** – Highlights key issues in implementing policy to protect and enhance the natural environment, agricultural land, soils and brownfield land of environmental value, green infrastructure, biodiversity, geodiversity, ecosystems and landscapes.

7.9 The **Environment Act 2021** **[See reference 338]** sets statutory targets for the recovery of the natural world in four priority areas: air quality, biodiversity,

water, and resource efficiency and waste reduction. Biodiversity elements in the Act include:

- Strengthened biodiversity duty. Both onsite and offsite enhancements must be maintained for at least 30 years after completion of a development;
- Biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- Duty upon Local Authorities to consult on street tree felling;
- Strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;
- Prohibit larger UK businesses from using commodities associated with wide-scale deforestation; and
- Requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain, requires regulated businesses to report on their due diligence, introduces a due diligence enforcement system.

7.10 A Green Future: Our 25 Year Plan to Improve the Environment [See reference 339]: Sets out goals for improving the environment within the next 25 years. It details how the Government will work with communities and businesses to leave the environment in a better state than it is presently. Identifies six key areas around which action will be focused. Those of relevance to this chapter are recovering nature and enhancing the beauty of landscapes; securing clean, productive and biologically diverse seas and oceans; and protecting and improving our global environment. Actions that will be taken as part of these three key areas are as follows:

- Recovering nature and enhancing the beauty of landscapes:

  - Develop a Nature Recovery Network to protect and restore wildlife and provide opportunities to re-introduce species that have been lost from the countryside.

- Securing clean, healthy, productive and biologically diverse seas and oceans:
  - Achieve a good environmental status of the UK's seas while allowing marine industries to thrive and complete our economically coherent network of well-managed marine protected areas.
- Protecting and improving our global environment:
  - Provide international leadership and lead by example in tackling climate change and protecting and improving international biodiversity.
  - Support and protect international forests and sustainable agriculture.

7.11 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 **[See reference 340]** protect biodiversity through the conservation of natural habitats and species of wild fauna and flora, including birds. The Regulations lay down rules for the protection, management and exploitation of such habitats and species, including how adverse effects on such habitats and species should be avoided, minimised and reported.

7.12 Biodiversity offsetting in England Green Paper **[See reference 341]**: Biodiversity offsets are conservation activities designed to compensate for residual losses. The Green Paper sets out a framework for offsetting.

7.13 England Biodiversity Strategy Climate Change Adaptation Principles (2008) **[See reference 342]:** sets out principles to guide adaptation to climate change. The principles are to take practical action now; maintain and increase ecological resilience; accommodate change; integrate action across all sectors; and develop knowledge and plan strategically. The precautionary principle underpins all of these.

7.14 Natural Environment and Rural Communities Act 2006 **[See reference 343]**: Places a duty on public bodies to conserve biodiversity.

Regional and local

7.15 Essex Coast Recreational disturbance Avoidance and Mitigation Strategy (RAMS) 2018-2038 [See reference 344] This Strategy aims to deliver the mitigation necessary to avoid significant adverse effects from 'in-combination' impacts of residential development that is anticipated across Essex; thus protecting the European sites on the Essex coast, including the Thames Estuary and Marshes Ramsar site and Special Protection Area, from adverse effects on site integrity. This includes a detailed programme of strategic mitigation measures which are to be funded by developer contributions from all new residential developments within the zone of influence. The **Essex Coast RAMS Supplementary Planning Document [See reference 345]** prepared in 2020 accompanies the strategic approach to mitigation set out in the RAMS 2018-2038.

7.16 South Essex Green and Blue Infrastructure Strategy: Resilient by Nature [See reference 346]: This strategy sets out a vision for and integrated green and blue infrastructure (GBI) network across South Essex and sets out key objectives and projects to achieve this. This includes protecting and enhancing biodiversity, for example through habitat restoration and creation, as well as integrating green space and links into development.

7.17 Green Essex Strategy [See reference 347]: This Strategy seeks to enhance, protect and create an inclusive and integrated network of high-quality green infrastructure in Greater Essex, to create a county-wide understanding of green infrastructure – its functions and values, and to identify opportunities for implementing green infrastructure. The Strategy recognises the importance of GI in terms of environmental benefits, including biodiversity. The Strategy highlights the importance of GI in providing ecological networks of all scales, from regional to neighbourhood scale.

7.18 South East Inshore Marine Plan [See reference 348]: The Plan introduces a strategic approach to planning within the inshore waters between Suffolk and Kent, including the Thames Estuary. The Plan seeks to protect the marine environment, including direct protection and consideration of biodiversity

assets, as well as avoiding, minimising and mitigating adverse impacts on air and water quality.

7.19 Thurrock Biodiversity Action Plan 2007-2012 [See reference 349]: Although the UK Biodiversity Action Plans were archived in 2012, the document provides an evidence base and framework for wildlife conservation priorities across Thurrock. This includes the conservation and protection of priority habitats that support many species. The main objectives of the Biodiversity Action Plan are to:

- Raise awareness of the importance of biodiversity;
- Raise awareness of all biodiversity action plans, habitats and species;
- Monitor populations of BAP species and areas of BAP habitats in Thurrock;
- Maintain the existing areas of habitats and population of species listed in the BAP and work to increase these where possible;
- Ensure that habitats are managed and maintained in the light of their ecological value; and
- Encourage responsible maintenance of land in Thurrock.

7.20 As part of the preparation of the Local Plan, Thurrock Council is currently preparing a **Habitats Regulation Assessment of the Local Plan**, a **Green and Blue Infrastructure Strategy** and a **Local Wildlife Sites Study** which will be taken into account in the next iteration of the IIA. A **Local Nature Recovery Strategy for Essex** is also due to be prepared to replace the Biodiversity Action Plan however, it is at a very early stage in development.

Implications of the policy review for the Local Plan and IIA

In order to align with the international, national, regional and local policies outlined above, the Local Plan should seek to manage, protect and enhance ecological features and biodiversity and encourage habitat restoration or creation. The Local Plan should also seek to ensure that environmental pollution is minimised in order to protect land, water and air quality.

The Local Plan should seek to take the following themes into account: conservation; creation; connection; and celebration. The Local Plan should embed the principle of environmental net gain and tackling invasive species. The IIA is able to respond to this through the inclusion of IIA objectives relating to the protection and enhancement of biodiversity, air pollution, water quality and contaminated land.

Baseline information

Biodiversity

Current baseline information

7.21 Thurrock is notable for its biodiversity due to several of its characteristics, such as its geology, orientation, and microclimate, as well as past and contemporary land usage. Figure 7.1 illustrates the location and extent of the designated biodiversity sites in Thurrock. Notable among these is the Thames

Estuary and Marshes Ramsar site and Special Protection Area (SPA) which lies partly within Thurrock. It covers approximately 5,500 hectares from the north bank of the outer estuary from Coalhouse Point in East Tilbury to the most western part of the reclaimed land at Mucking Flats. Much of the site is brackish grazing marsh, although some parts have been converted to arable use. The estuary and adjacent marsh areas support an important assemblage of wintering water birds including grebes, geese, ducks and waders. Over winter, the area regularly supports a large population of waterfowls and is also important during spring and autumn for migratory birds **[See reference** 350**]**. Further detail regarding the qualifying features and key sensitivities of this European designated site and others within 15km of the Borough is provided in the HRA Scoping Report.

7.22 Thurrock contains 12 Sites of Special Scientific Interest (SSSIs), covering a total area of over 1,300 hectares. Out of the 12 SSSIs within Thurrock, only three are in entirely favourable condition, namely Hangman's Wood SSSI, Lion Pit SSSI and Holehaven Creek SSSI. Mucking Flats and Marshes SSSI is almost entirely in favourable condition (94.13%) with the rest of the site classed as unfavourable and recovering. The following SSSIs were found to be partly or entirely in unfavourable condition **[See reference** 351**]**:

- **Purfleet Chalk Pits SSSI:** 56.57% of this SSSI is in favourable condition, with 35.48% unfavourable and declining and 7.96% destroyed.
- **Inner Thames Marshes SSSI:** 42.37% of this SSSI is in favourable condition, 31.36% is unfavourable and declining, and 17.8% is unfavourable and recovering.
- **West Thurrock Lagoon and Marshes SSSI:** 66.69% of this SSSI is in unfavourable and declining condition, with 33.31% designated as unfavourable with no change.
- **Purfleet Road, Aveley SSSI:** 75.34% of this SSSI is in unfavourable condition with no change, and 24.66% favourable.
- **Langdon Ridge SSSI:** 80.50% of this SSSI is in unfavourable and recovering condition, with the rest in favourable condition.

- **Vange & Fobbing Marshes SSSI:** 91.54% of this SSSI is in unfavourable and recovering condition, with the rest designated as favourable.
- **Grays Thurrock Chalk Pit SSSI:** 100% of this SSSI is in unfavourable and recovering condition.
- **Globe Pit SSSI:** 100.00% of this SSSI is in unfavourable and declining condition.

7.23 There are two designated Local Nature Reserves (LNRs) within Thurrock at Linford Wood and Grove House Wood. Linford Wood LNR in Linford is an area of woodland covering 3.46 hectares. It consists of a hedge bank, mixed woodland, willow plantation, ditches and an open area surrounded by arable farmland. The wood provides a habitat for wildlife, including tawny owls, great spotted woodpeckers and green woodpeckers, as well as migrant birds in spring and autumn. Grove House Wood in Stanford-Le-Hope is a 2.24 hectares area with a mixture of habitats including reed beds, a pond and brook as well as the woods. The site is an important haven for wildlife in an area where no similar large habitats are found, while dead elms in the wood provide nesting sites for woodpeckers.

7.24 There are currently 70 Local Wildlife Sites (LWSs), 12 wildlife corridors and 11 habitat chains/clusters in Thurrock **[See reference** 352**]**. According to Natural England **[See reference** 353**]**, there are 20 ancient woodland sites in Thurrock, the largest being Millard's Garden and Brannetts Wood in South Ockenden, and Northlands Woods in Langdon Hills Country Park (see Figure 7.2) **[See reference** 354**]**. The majority of ancient woodlands in the Borough are also designated as LWSs.

7.25 Thurrock contains a number of national Priority Habitats. The Thurrock Biodiversity Action Plan (albeit currently out of date) identified nine priority habitats that support nature conservation and biodiversity in Thurrock **[See reference** 355**]**:

- **Ancient woodland** – UK and Essex biodiversity priority habitat.
- **Calcareous grassland** – UK biodiversity priority habitat.

- **Coastal grazing marsh** – The main areas of marshland in Thurrock are located at the eastern and western ends of the Borough. UK and Essex biodiversity priority habitat.
- **Brownfield wildlife land** – Thurrock holds important areas of high value brownfield wildlife land, which often supports large numbers of reptiles, rare and scarce plants and invertebrates.
- **Lowland heathland** – UK priority habitat of European importance and included in the Essex Biodiversity Action Plan.
- **Reedbeds** – UK and Essex biodiversity priority habitat. Thurrock has approximately 15ha of reedbeds that support birds and insect species that are dependent on this habitat.
- **Roadside verges** – In Thurrock roadside verges contain some of the most important Thames Terrace Grassland invertebrate assemblages that support a rich variety of species.
- **Thames Terrace grasslands** – These grasslands support a diverse collection of invertebrate species that have been identified as of national importance by English Nature.
- **Urban habitats** – Grays/Chafford, Stanford/Corringham and Ockendon contain open spaces and green infrastructure which are valuable for plants and insects. UK and Essex biodiversity priority habitat.

7.26 Priority species identified within the Thurrock Biodiversity Action Plan are brown hare, bats, hedgehogs, water vole, black redstart, skylark, song thrush, adder, grass snake, great crested newts, glow-worm, hornet robberfly, shrill carder-bee, stag beetle, black poplar and broadleaved cudweed.

7.27 Significant plant and invertebrate communities have resulted from the large quantity of brownfield land that has been left unmanaged. The ecology of these brownfield sites should be considered prior to decisions about the sites' future. The River Thames, remnants of the Thames Terrace grasslands, and coastal marshes all sustain a diverse range of marine and terrestrial species, but much of it has been lost to agriculture or industrial usage **[See reference** 356**]**. Thurrock is home to a diverse assemblage of invertebrates, many of which are

nationally rare. While certain species are legally protected, many Red Data Book and/or UK Biodiversity Action Plan species are not. It is important that sites with unusually diverse assemblages are safeguarded.

7.28 Thurrock Council recently published its Public Land Maintenance Strategy **[See reference** 357**]** which aims to increase biodiversity and habitats through long grass/wildflowers/meadow planting; planting low maintenance schemes; and tree planting "of appropriate trees, where it is possible do so and where they will have a positive impact on the environment".

7.29 Thurrock contains a 'Greengrid' spanning the Borough which comprises a sustainable network of multi-functional greenspace and linking Thurrock's towns and countryside. The green and blue infrastructure (GBI) network provides valuable habitats and ecological corridors for movement of species. The Greengrid overlaps and connects with other sub-regional green infrastructure frameworks, primarily the South Essex Greengrid, the Thames Chase Community Forest in the north and west of the Borough, and the Green Arc which extends out from London and encompasses the north western area of the Borough.

7.30 Natural England's Green Infrastructure Database **[See reference** 358**]** provides an overview of Thurrock's GBI provision. Thurrock has sufficient provision of natural/semi-natural greenspace, with a current provision of 7.82 hectares per 1,000 population compared with the Field In Trust (FIT) standard of 1.8ha per 1,000. The majority of natural and semi-natural greenspace in Thurrock (69%) can be attributed to a handful of large sites; Belhus Wood Country Park, Corringham Marches, Fobbing Marsh, Langdon Hill Country Park and Rainham & Aveley Marshes. Thurrock currently has a deficiency in Local Nature Reserves based on Natural England's Accessible Natural Greenspace Standard (ANGSt).

Projected baseline information

7.31 At UK level, the recent publication of the State of Nature Report **[See reference** 359**]** provides an overview of the health of the country's wildlife and how human impacts are driving sweeping changes in the UK. It looks back over 50 years of monitoring to see how nature has changed since the 1970s, averaging a 13% decline in the average abundance of wildlife in the UK since the 1970s, with key drivers for change being agricultural productivity, climate change and increasing average temperatures, urbanisation and hydrological changes. The report finds that on average, metrics suggest that decline in species abundance and distribution of species has continued in the UK throughout the most recent decade.

7.32 At local level, many of Thurrock's most important wildlife sites are located in urban areas, with Langdon Hills' complex of woods and grassland on either side of One Tree Hill being the main exception. Sites of importance for invertebrate populations can be found in the urban areas of Grays, Purfleet, West Thurrock, and Tilbury, posing a considerable risk of conflict with the development pressures in the Thames Gateway, which is one of the Government's Growth Areas. It is difficult to predict future changes in the baseline for biodiversity, flora and fauna. However, previously trends have shown development can have both adverse and beneficial impacts on biodiversity, flora and fauna. Development can cause loss of and damage to habitats, but innovative design and the creation of green corridors can help offset such impacts and even enhance biodiversity at local level.

Implications for health

7.33 A strong link exists between access to nature and biodiversity and associated health and societal benefits. In light of the COVID-19 pandemic, the importance of safe, accessible and well-connected green and blue spaces for improving quality of life has also never been more pertinent.

7.34 According to the recently published World Health Organisation report 'Nature, Biodiversity and Health: An Overview of Interconnections' **[See reference** 360**]** increased exposure to nature has been associated with a lower risk of specific health conditions including depression, anxiety, cortisol, blood pressure, pre-term birth, low birthweight, type 2 diabetes, and reduced risk of death from all causes. There is generally positive evidence relating to the impacts of activities in natural environments on children's mental health and their cognitive, emotional and behavioural functioning. These health benefits are thought to arise through a range of pathways, including providing opportunities and safe spaces for physical activity, for restoration and relaxation, and for socialising with friends and family. Exposure to green and blue space is also associated with higher levels of life satisfaction. Impacts appear to differ according to socio-economic status and other demographic factors such as age or gender.

7.35 Increased urbanisation, growing populations and changes in land use are leading to reduced availability of high-quality green and blue spaces. Adequate and equitable access to high-quality green and blue environments is an issue in Thurrock, with 22% of Thurrock neighbourhoods having poor access to nature and 47% having only moderate access, particularly affecting disadvantaged neighbourhoods **[See reference** 361**]**. Insufficient provision of urban parks and other nature areas can result in overuse of existing nature areas, leading to damage and loss of habitats for biodiversity.

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Figure 7.1 Designated Biodiversity Assets

- Thurrock Council boundary
- Neighbouring authority boundary
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Ramsar
- Special Area of Conservation (SAC)
- Special Protected Area (SPA)
- Sites of Specific Scientific Interest (SSSI)

Epping Forest
Brentwood
Chelmsford
Rochford
Basildon
Havering
Barking and Dagenham
Castle Point
Bexley
Dartford
Medway
Gravesham
Bromley
Sevenoaks

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG7_1_6999_Designated_biodiversity_A3L 27/04/2022
Source:LUC, TC, NE

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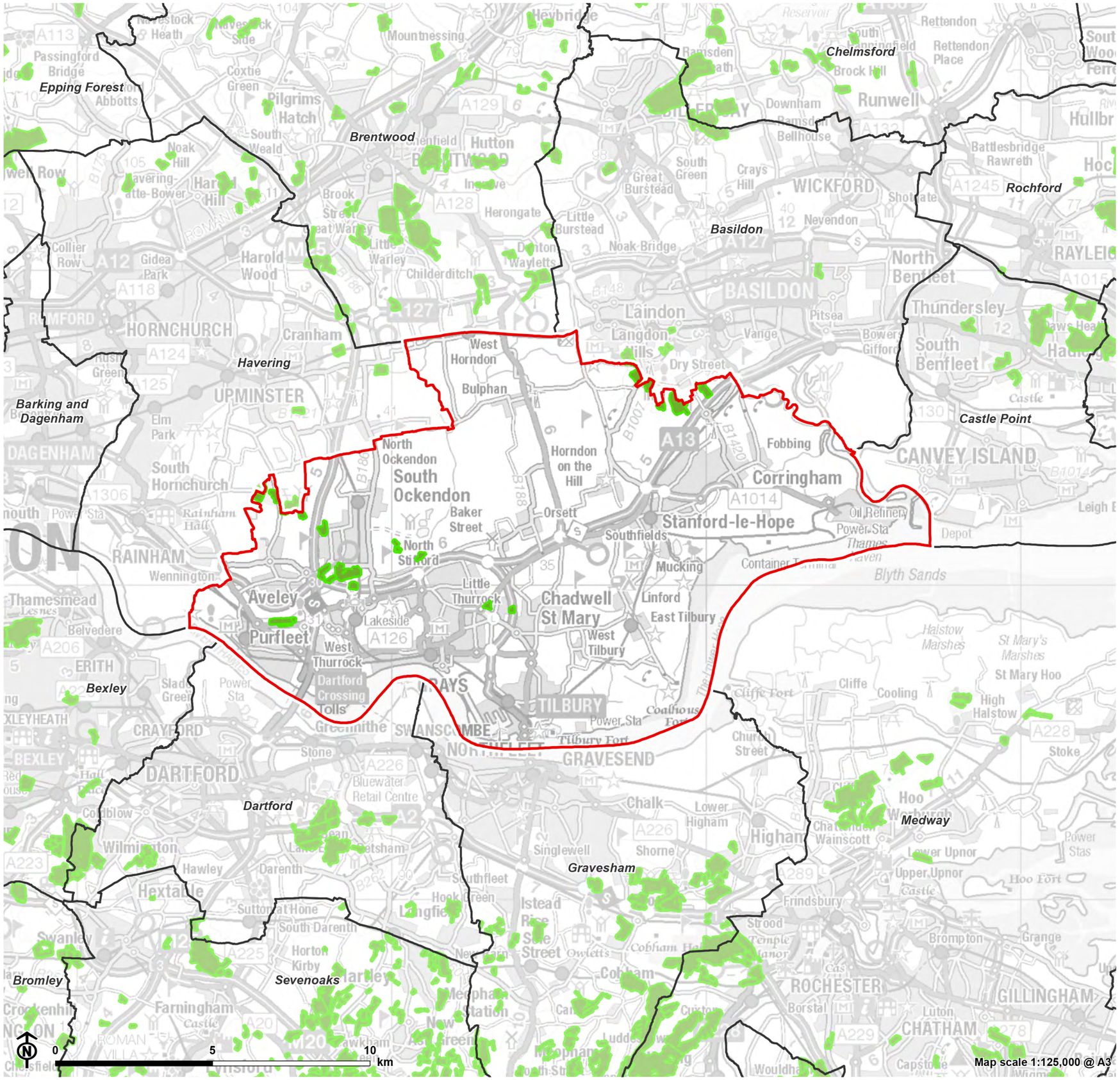
Figure 7.2: Ancient Woodland



CB:AHB EB:Tomlinson_J LUC FIG7_2_6999_AWI_A3L 26/04/2022
Source:LUC, TC, EA, NE

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Key sustainability issues and likely evolution of these issues without the Local Plan

7.36 Thurrock contains many areas of high ecological value including sites of international and national importance, some of which are in unfavourable condition. As well as the potential for loss of functionally linked habitat, development puts pressure on these sites including through disturbance and damage from recreational use, air pollution, water supply and treatment. Brownfield sites are key areas for biodiversity in Thurrock, particularly regarding invertebrate assemblages. However, these urban habitats often experience conflict with the development pressures in the Thames Gateway, which is one of the Government's Growth Areas.

7.37 Although designated sites represent the most valued habitats in the Borough, the overall ecological network is important for biodiversity as a whole. The ecological network in Thurrock will form part of the national Nature Recovery Network. The Nature Recovery Network supports the health of designated sites and other wildlife-rich places, allowing species to migrate in response to climate change. Fragmentation and erosion of habitats and the Nature Recovery Network is an ongoing threat to biodiversity.

7.38 Even without the Local Plan, some important habitats and biodiversity sites will continue to receive statutory protection. However, without the Local Plan it is possible that development could be sited inappropriately and adversely impact biodiversity sites, even if indirectly. The Local Plan presents an opportunity to manage the sensitivities of the sites and biodiversity networks, for example by locating development away from the most sensitive locations, provide for new GBI, and ensure that growth does not adversely affect their current condition but where possible contributes to their improvement.

Chapter 8

Historic environment

Policy context

International

8.1 Valletta Treaty (1992) formerly the European Convention on the Protection of the Archaeological Heritage (Revisited) **[See reference 362]**: Aims to protect the European archaeological heritage "as a source of European collective memory and as an instrument for historical and scientific study".

8.2 European Convention for the Protection of the Architectural Heritage of Europe (1985) **[See reference 363]**: Defines 'architectural heritage' and requires that the signatories maintain an inventory of it and take statutory measures to ensure its protection. Conservation policies are also required to be integrated into planning systems and other spheres of Government influence as per the text of the convention.

8.3 UNESCO World Heritage Convention (1972) **[See reference 364]**: Requires signatories to identify and conserve World Heritage sites situated on its territory and protect its national heritage. The States Parties are encouraged to integrate the protection of the cultural and natural heritage into regional planning programmes, set up staff and services at their sites, and undertake scientific and technical conservation research.

National

8.4 Of relevance to the approach of the planning system to the historic environment the **NPPF** (2021) **[See reference 365]** contains an environmental objective to contribute to the protection and enhancement of the built and historic environment. The document also sets out a strategy to seek "the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay and other threats". Such a strategy is required to take into consideration the desirability of sustaining and enhancing the significance of heritage assets and bringing them into viable use.

8.5 It should also be considerate of the wider benefits of conserving the historic environment, the contribution new development can make in terms of character and distinctiveness and the opportunity for the historic environment to contribute to this character and distinctiveness. Local authorities should also maintain or have access to a historic environment record which is to be supported by up-to-date evidence.

8.6 The NPPF is supported by planning practice guidance relating to:

- **Historic environment** (2019) **[See reference 366]** – Advises on enhancing and conserving the historic environment through planning, decision-making, designation, listed building consent processes and consultation.

8.7 The **Environment Act 2021** **[See reference 367]** sets out the UK's new framework for environmental protection. It includes the creation of Conservation Covenant agreements between a landowner and a responsible body for the purposes of conservation. This can include to preserve land as a place of 'archaeological, architectural artistic, cultural or historic interest'.

8.8 The **Heritage Statement 2017** **[See reference 368]**: Sets out how the Government will support the heritage sector and help it to protect and care for our heritage and historic environment, in order to maximise the economic and

social impact of heritage and to ensure that everyone can enjoy and benefit from it.

8.9 Sustainability Appraisal and Strategic Environmental Assessment, Historic England Advice Note 8 [See reference 369]: Sets out requirements for the consideration and appraisal of effects on the historic environment as part of the Sustainability Appraisal/Strategic Environmental Assessment process.

8.10 The **Government's Statement on the Historic Environment for England 2010 [See reference 370]**: Sets out the Government's vision for the historic environment. It calls for those who have the power to shape the historic environment to recognise its value and to manage it in an intelligent manner in light of the contribution that it can make to social, economic and cultural life. Includes reference to promoting the role of the historic environment within the Government's response to climate change and the wider sustainable development agenda.

8.11 Planning (Listed Buildings & Conservation Areas) Act 1990 [See reference 371]: An Act of Parliament that changed the laws for granting of planning permission for building works, with a particular focus on listed buildings and conservation areas.

8.12 Ancient Monuments & Archaeological Areas Act 1979 [See reference 372]: a law passed by the UK government to protect the archaeological heritage of England & Wales and Scotland. Under this Act, the Secretary of State has a duty to compile and maintain a schedule of ancient monuments of national importance, in order to help preserve them. It also creates criminal offences for unauthorised works to, or damage of, these monuments.

8.13 Historic Buildings and Ancient Monuments Act 1953 [See reference 373]: An Act of Parliament that makes provision for the compilation of a register of gardens and other land (parks and gardens, and battlefields).

Regional and local

8.14 Essex Historic Landscape Characterisation Project [See reference 374]: This project seeks to characterise the distinctive historic dimension of the current rural landscape. The project identifies 54 Historic Landscape Characterisation (HLC) types across Essex which are broadly categorised into 10 categories (enclosed land, open land, woodland, parks & gardens, coastal, settlement, industrial, horticulture, military and land use).

8.15 Thames Estuary Growth Commission 2050 Vision [See reference 375]: The 2050 Vision for the Thames Estuary seeks to celebrate the character and heritage of the Thames Gateway area, including the rivers and recognises that heritage assets can help build economic prosperity and create quality of life.

8.16 South East Inshore Marine Plan [See reference 376]: The Plan introduces a strategic approach to planning within the inshore waters between Suffolk and Kent, including the Thames Estuary. This includes a policy on conserving and enhancing elements contributing to the significance of heritage assets.

8.17 Thurrock Scheduled Ancient Monuments Assessment of Settings [See reference 377]: This report provides a detailed assessment of the significance of the setting of the Scheduled Monuments in Thurrock in response to developing the Thurrock Local Plan. The monument types range from the large and imposing, as is the case with Tilbury and Coalhouse Fort, to belowground archaeological remains which have a less visual presence in the landscape.

8.18 Thurrock Unitary Historic Environment Characterisation Project: The project considers the sensitivity, diversity and value of historic environment resources within Thurrock and aims to facilitate development of positive approaches to the integration of historic environment objectives into spatial planning.

8.19 Thurrock Conservation Area Character Appraisals [See reference 378] : Character appraisals of the seven Conservation Areas in Thurrock assess the areas and evaluate their special interests and significance.

Implications of the policy review for the Local Plan and IIA

In order to align with the policies outlined above, the Local Plan should seek to conserve and enhance the historic environment, including heritage and cultural assets both designated and undesignated, and to protect local character and distinctiveness. Particular regard should be given to protecting heritage assets which have been identified as being 'at risk' (both at the national and local level). Policies should be included to address these issues and site options should be considered with regard to the potential for adverse effects on the historic environment.

The IIA Framework should include objectives relating to the conservation and enhancement of the historic environment and the character of landscapes and townscapes. The IIA should appraise both policy and site options in terms of the potential for effects on the historic environment. It should identify those locations at which development would have the greatest potential to adversely impact the historic environment, as informed by heritage impact assessment work for the Local Plan.

Baseline information

Heritage assets

Current baseline information

8.20 The Essex Historic Landscape Characterisation Project **[See reference** 379**]** identifies the predominant Historic Landscape Characterisation (HLC) types in Thurrock as 20th century agriculture; built up areas; coastal – drained enclosure; coastal – managed wetland; mineral; industry; pre-18th century enclosure; and parks and gardens.

8.21 Thurrock has a range of unique heritage assets that contribute to the character of the Borough. The assets include Scheduled Monuments, Listed Buildings (Grade I, Grade II* and Grade II), Conservation Areas and a Registered Park and Garden. These assets are shown in Figure 8.1.

8.22 Highlighted in the National Planning Policy Framework, non-designated heritage assets are singular buildings, structures and monuments or landscapes that are believed to have a degree of heritage significance and make a significant impact to local character, identity and sense of place. However, despite their level of heritage significance, these sites do not meet the criteria set out for statutory listing through Historic England **[See reference 380]**.

8.23 Thurrock contains a number of important historic assets including **[See reference** 381**]**:

- Seven Conservation Areas:
  - Horndon-on-the-Hill;
  - Corringham;
  - Orsett;

  - Fobbing;
  - Purfleet;
  - West Tilbury; and
  - East Tilbury.
- 242 entries in the List of Buildings of Special Architectural or Historic Interest (13 Grade I, 210 Grade II and 19 Grade II*);
- 17 Scheduled Monuments;
- One Registered Park and Garden at Belhus Park;
- 20 ancient woodland sites; and
- 1,101 Archaeological records on the Essex Historic Environment Record **[See reference 382]**.

Heritage at Risk

8.24 Historic England has a Heritage at Risk Register **[See reference 383]** which includes historic buildings, listed buildings, sites and Conservation Areas at risk of being lost through neglect, deterioration or decay. The register aims to highlight those places and buildings in greatest need of repair.

8.25 East Tilbury Conservation Area, which consists of the former factor complex of British Bata Shoe Company and a large housing development in a ‘garden village’ setting, is included in the Heritage at Risk Register. Its condition is described as ‘very bad’ and ‘deteriorating’.

8.26 Belhus Park is the only Registered Park and Garden in Thurrock. Its condition is described as ‘generally unsatisfactory with major localised problems’ and it is ‘declining’ in condition. The M25 cut through the east of Belhus Park and surviving features are in very poor condition. The Park supports a golf course and other formal and informal recreational uses.

8.27 Two Scheduled Monuments are included in the Register. These are:

- Crop mark complex, Orsett is 'generally unsatisfactory with major localised problems' and is 'declining' in condition; and
- Coalhouse Fort, Tilbury is a ruined C19 armoured casemate fort that is considered to be in a 'very bad' condition. There is a repair scheme in progress and the site is part occupied/part in use.

8.28 Thurrock has one Listed Building on the Heritage at Risk Register, namely the State Cinema, George Street, Grays (Grade II*). Its condition is categorised as 'very bad' and it is currently unoccupied. However, a repair scheme is in progress.

8.29 The heritage assets identified on the Historic England at Risk Register are shown in Figure 8.2.

Projected baseline information

8.30 The historic environment can be considered a finite resource. It cannot be replaced and is susceptible to decline over time as historic features experience degradation and decay. However, cultural heritage as a whole can evolve and change, and features which are not currently considered a valued part of the historic environment may become so in the future, either due to their uniqueness, past use, or historic or cultural significance.

8.31 At local level, new developments, infrastructure and environmental pressures, such as extreme weather and flooding, present the greatest risk to cultural heritage assets.

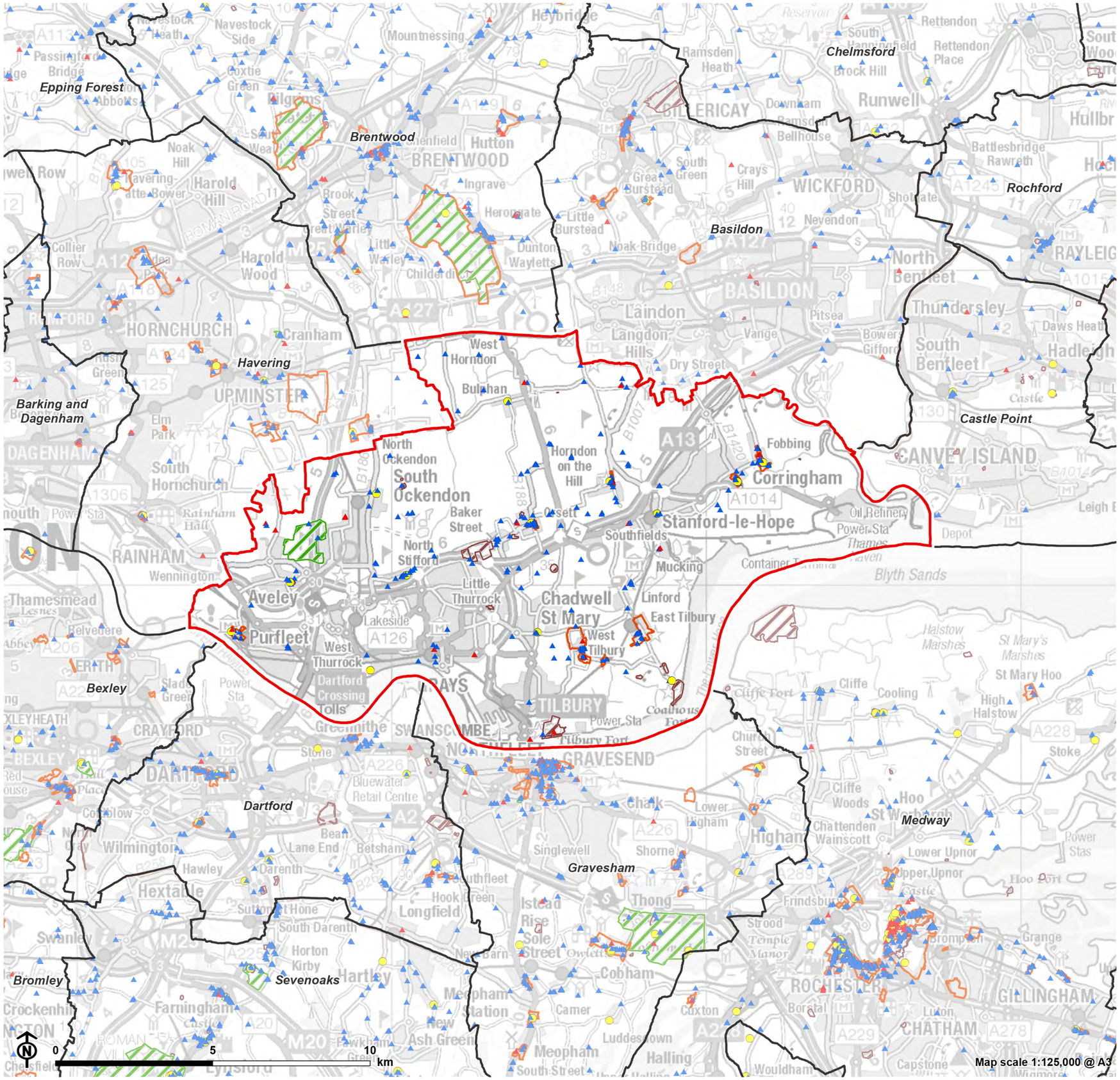
Implications for health

8.32 Historic England explored the links between the historic environment and health in Wellbeing and the Historic Environment **[See reference** 384**]**. This

identified mental and social wellbeing benefits of the historic environment, including opportunities to meet people and expand knowledge through volunteering or visiting historic sites and giving people a sense of place, community and belonging.

LUC

Figure 8.1: Designated Heritage Assets



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Source:LUC, TC, HE

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Integrated Impact Assessment of Thurrock Local Plan
for Thurrock Council

LUC

Figure 8.2: Heritage at Risk

Thurrock Council boundary
Neighbouring authority boundary
Heritage at Risk

Epping Forest
Brentwood
Chelmsford
Basildon
Rochford
Havering
Barking and Dagenham
Castle Point
Bexley
Dartford
Gravesham
Medway
Bromley
Sevenoaks

0 5 10 km

Map scale 1:125,000 @ A3

CB:AHB EB:Tomlinson_J LUC FIG8_2_6999_heritage_atrisk_A3L 27/04/2022
Source:LUC, TC, HE

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Key sustainability issues and likely evolution of these issues without the Local Plan

8.33 There are many designated and undesignated heritage assets and areas of historical and cultural interest in Thurrock that could be adversely affected by climate change and poorly-located or designed development. There are a number of heritage assets listed on the Heritage at Risk Register including East Tilbury Conservation Area, Belhus Park, two Scheduled Monuments and one Listed Building, some of which are deteriorating in condition.

8.34 While a number of the heritage assets in Thurrock, for example Listed Buildings and Scheduled Monuments, will continue to be protected by statutory designations, without the Local Plan it is possible that these, and undesignated assets, will be adversely affected by inappropriate development. The Local Plan provides an opportunity to protect these assets (including their settings) from inappropriate development, as well as enhancing the historic environment and improving accessibility and interpretation of distinctive features of local heritage.

Chapter 9

Landscape and townscape

Policy context

International

9.1 The **European Landscape Convention** (2000) **[See reference 385]**: Promotes landscape protection, management and planning. The Convention is aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape.

National

9.2 The **NPPF** (2021) **[See reference 386]** includes as part of its approach to protecting the natural environment, recognition for the intrinsic character and beauty of the countryside, and the wider benefits to be secured from natural capital. Importantly, great weight is to be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB).

9.3 As part of the approach to achieving well-designed places the NPPF states that planning policies and decisions should ensure that developments “are sympathetic to local character and history, including the surrounding built environment and landscape setting”.

9.4 The NPPF is supported by planning practice guidance relating to:

- **Natural environment** (2019) **[See reference 387]** – Highlights key issues in implementing policy to protect and enhance the natural environment,

agricultural land, soils and brownfield land of environmental value, green infrastructure, biodiversity, geodiversity, ecosystems and landscapes.

- **Green Belt** (2019) **[See reference 388]** – Provides advice on the role of the Green Belt in the planning system, removal of land from the Green Belt and compensatory improvements.

9.5 The **Environment Act 2021** **[See reference 389]** sets out the UK's new framework for environmental protection. It includes the creation of Conservation Covenant agreements between a landowner and a responsible body for the purposes of conservation of the natural environment of the land or its natural resources, or to conserve the place or setting of the land for its 'archaeological, architectural, artistic, cultural or historic interest'.

9.6 A Green Future: Our 25 Year Plan to Improve the Environment **[See reference 390]**: Sets out goals for improving the environment within the next 25 years. It details how the Government will work with communities and businesses to leave the environment in a better state than it is presently. Identifies six key areas around which action will be focused. Those of relevance to this chapter are 'recovering nature' and 'enhancing the beauty of landscapes'. Actions that will be taken as part of this key area are as follows:

- Working with AONB authorities to deliver environmental enhancements; and
- Identifying opportunities for environmental enhancement of all England's Natural Character Areas, and monitoring indicators of landscape character and quality.

9.7 Countryside and Rights of Way Act 2010 **[See reference 391]:** An Act of Parliament to make new provision for public access to the countryside.

9.8 National Parks and Access to the Countryside Act 1949 **[See reference 392]**: An Act of Parliament to make provision for National Parks and the establishment of a National Parks Commission; to confer on the Nature Conservancy and local authorities' powers for the establishment and maintenance of nature reserves; to make further provision for the recording,

creation, maintenance and improvement of public paths and for securing access to open country.

Regional and local

9.9 South Essex Green and Blue Infrastructure Strategy: Resilient by Nature [See reference 393]: This strategy sets out a vision for and integrated green and blue infrastructure (GBI) network across South Essex and sets out key objectives and projects to achieve this. This includes building landscape connectivity, celebrating unique landscape features and creating a sense of place.

9.10 Green Essex Strategy [See reference 394]:This Strategy seeks to enhance, protect and create an inclusive and integrated network of high-quality green infrastructure in Greater Essex, to create a county-wide understanding of green infrastructure – its functions and values, and to identify opportunities for implementing green infrastructure. The Strategy notes that enhancing environmental and landscape quality is one of the functions of green infrastructure.

9.11 South East Inshore Marine Plan [See reference 395]: The Plan introduces a strategic approach to planning within the inshore waters between Suffolk and Kent, including the Thames Estuary. This includes a policy that seeks to avoid, minimise and mitigate adverse effects on seascapes and landscapes.

9.12 While not a plan or policy, the Essex Design Guide **[See reference 396]** provides a reference to help create high quality places with an identity specific to its Essex context. The Design Guide covers a number of aspects of environmental and socio-economic considerations and therefore relates to a number of sustainability topics, including landscape.

9.13 Thurrock Green Belt Assessment Stages 1a and 1b [See reference 397]: The Thurrock Green Belt Assessment was conducted on behalf of

Thurrock Council with the aim of assessing the Green Belt. Stage 1a of the assessment relates to the identification of strategic Green Belt parcels and the assessment of each parcel against the purposes of the Green Belt, as set out in NPPF. Stage 1B of the assessment relates specifically to the proposed new Lower Thames Crossing route, and the implications for the Green Belt. This report is a precursor to Stage 2 of the assessment, which will identify detailed assessment of sites and boundaries in the Green Belt to identify defensible long-term boundaries and provide recommendations on detailed boundary changes.

9.14 Thurrock Landscape Character Assessment [See reference 398]: Thurrock Landscape Character Assessment was commissioned in 2015 by Thurrock Council to review and update the existing landscape character evidence base, providing context for policies, proposals and strategic decision-making. The assessment provides an overview of the evolution of the Borough's landscape over time, including physical and historical influences, and summarises current forces for change. The study identifies seven strategic-scale landscape types/areas in the Borough. Within these character areas, the study identifies a further 12 local-level landscape types/areas. Volume II of the study provides in-depth profiles of the landscape character types and areas within the Borough, including descriptions and evaluative information.

9.15 Thurrock Landscape Capacity Study [See reference 399]: The study's purpose was to assess the ability of the landscape of the Borough to accommodate various development scenarios by testing the sensitivity of different landscape character types to a generalised increased in development. The study also specifically tested the capacity of the landscape to accommodate various development options around key settlements in the Borough, particularly urban extensions and development on the urban fringe. The study identified five Landscape Character Types in the Borough, based on analysis of geology, soils, topography, land cover and settlement pattern, i.e., the Fenland Landscape, Rolling Farmland/Wooded Hills Landscape, Marsh Landscape, Urban Fringe Landscape, and the Urban Landscape. These are further divided into 23 Landscape Character Areas, confirming the relatively diverse nature of Thurrock's landscape.

9.16 As part of the preparation of the Local Plan, Thurrock Council is currently preparing a **Landscape Character Assessment**, **Green and Blue Infrastructure Strategy** and **Stage 2 Green Belt Assessment** which will be taken into account in the next iteration of the IIA.

Implications of the policy review for the Local Plan and IIA

In order to align with the international, national, regional and local policies outlined above, the Local Plan should seek to:

- Protect and enhance designated and valued landscapes;
- Protect and enhance the quality and distinctiveness of natural landscapes and townscapes;
- Promote high quality design that respects and enhances local character; and
- Ensure tourism is compatible with protection of biodiversity, landscapes and townscapes.

The Local Plan should seek to increase recognition of the linkages and interplay between the different aspects and roles of landscape, including:

- Local distinctiveness;
- The historic environment;
- Natural resources;
- Farming, forestry and food;
- Educational, leisure and recreation opportunities;
- Transport and infrastructure; and
- Settlements and nature conservation.

The IIA is able to respond to this through the inclusion of IIA objectives relating to the character of landscapes and townscapes and green infrastructure.

Baseline information

Landscape and townscape

Current baseline information

Landscape character

9.17 Thurrock is generally a low-lying area with a ridge running though from Langdon Hills Country Park on the Basildon boundary, through Horndon on the Hill and Grays to Aveley and Kennington Park in the west of the Borough. There are two main rivers: the Thames which flows along the southern side, and the Mardyke which flows through the west of the Borough from north to south, meeting the Thames at Purfleet. Thurrock exhibits a mosaic of markedly contrasting landscapes; from open and relatively tranquil and undeveloped farmland in the rural parts of the Borough to the north, to the densely developed urban areas and industrial development adjacent to windswept grazing marshes along the Thames riverside **[See reference 400]**.

9.18 The Thames forms a distinctive ‘rivers cape’ along the southern edge of the Borough. In the west near Aveley Marshes, the Thames is narrow, widening towards Holehaven Creek in the east. Numerous jetties, wharfs and piers punctuate the northern bank, which is heavily industrialised for most of its length between Aveley Marshes and Tilbury, and again around Holehaven Creek. The presence of industry creates a dramatic riverscape of angular machinery and buildings, dock activity, river traffic and changing light reflected on the

constantly moving water of the Thames. This contrasts with adjacent open and low-lying marshes that accentuate the vertical features of the docks. Settlement has sprawled along an east-west band to the north of the river and at South Ockendon. Road and rail infrastructure, pylons and power lines are prominent features within the urban fringe landscapes. In contrast to the densely settled and industrialised areas, northern parts of the Borough are rural in character and the topography more undulating. Large, open prairie fields are a distinctive feature of the large scale and exposed landscape character in this area.

9.19 National Character Area (NCA) profiles created by Natural England are used to define the specific combination of landscape, geodiversity, biodiversity, history, culture and economic activity in an area. NCAs follow natural lines in the landscape instead of administrative boundaries **[See reference 401]**. The National Character Areas are shown in Figure 9.1. Thurrock contains two National Character Areas, namely the Northern Thames Basin (111) and the Greater Thames Estuary (81):

- **The Northern Thames Basin NCA** is diverse area which extends from Hertfordshire in the west to the Essex coast in the east. It is separated from the North Sea and Thames Estuary by a narrow band of land that makes up the Greater Thames Estuary National Character Area (NCA). Although arable agriculture is a large industry in the area the soil quality ranges from good to poor quality. The London Clay provides poor quality soil that becomes waterlogged in winter and cracks and shrinks in summer. Better quality soil is found in areas that contain alluvial deposits from the Thames and other rivers in the area as they formed and changed position over time. The Northern Thames Basin is an area rich in geodiversity, archaeology and history and diverse landscapes. Urban expansion has historically been a feature in this area which has put increased pressure on the landscape from housing developments, schools and other necessities for expanding populations, with a consequential reduction in tranquillity. Though tranquil areas are still found in many parts of South Essex in areas with a more dispersed settlement pattern. There are a wider variety of semi-natural habitats in this area, which support important species. However, the habitats have become fragmented over time. **[See reference 402]**.

- **The Greater Thames Estuary NCA** is a predominantly remote and tranquil landscape of shallow creeks, drowned estuaries, low-lying islands, mudflats and broad tracts of tidal salt marsh and reclaimed grazing marsh that lies between the North Sea and the rising ground inland. It forms the eastern edge of the London Basin and encompasses the coastlines of South Essex and North Kent, along with a narrow strip of land following the path of the Thames into East London. NCA contains some of the least settled areas of the English coast, with few major settlements and medieval patterns of small villages and hamlets on higher ground and the marsh edges. This provides a stark contrast to the busy urban and industrial areas towards London where population density is high and development pressures are increasing. Sea defences protect large areas of reclaimed grazing marsh and its associated ancient fleet and ditch systems, and productive arable farmland. Historic military landmarks are characteristic features of the coastal landscape **[See reference 403]**.

9.20 An Integrated Landscape Character Assessment of Thurrock Borough was undertaken in 2018 **[See reference 404]**. The assessment identified seven strategic scale landscape types, 12 local landscape types and 24 local scale character areas. Landscape types identified include:

- **River valley catchment** – River Mardyke valley catchment.
- **Wooded and farmed river terrace gravels** – Aveley and South Ockendon wooded and farmed river terrace gravels.
- **Low chalk ridge** – Grays conurbation low chalk ridge.
- **Marshland** – Thurrock marshland.
- **Undulating farmland** – Orsett to Chadwell undulating farmland.
- **Strategic river corridor** – River Thames strategic river corridor.

Landscape designations

9.21 Thurrock does not fall within or close to a designated Area of Outstanding Natural Beauty (AONB) or National Park; however, the Kent Downs AONB lies approximately 5km to the south of the River Thames.

9.22 With the exception of the principal urban area of Thurrock, and the towns and villages, all of the land within the Borough is designated as Green Belt. The Stage 1a and 1b Green Belt Assessment **[See reference** 405**]** identifies that in Thurrock, areas surrounding the urban areas towards the west of the Borough unsurprisingly contribute most to the first purpose of the Green Belt, i.e., to check the unrestricted sprawl of large built-up areas. With regard to the purpose of preventing neighbouring towns from merging, the designated Green Belt north of Purfleet and Grays fulfil this purpose by preventing merger with the towns of South Ockendon and Aveley. Similarly, parcels between Stanford-le-Hope, Corringham and Basildon serve the same function. In general, throughout the Borough, Green Belt boundaries are defined along weak features rather than clearly defined barriers, demonstrating the need for policies enhancing Green Belt boundaries and strengthening of green infrastructure.

9.23 The national demands for transport and energy networks have led to major infrastructure bisecting the rural landscape between historic village settlements. This has led to a distinctive feature of farmland edges to settlements and main roads. The tranquillity of the rural landscape has been diminished by national infrastructure however the visual separation of rural edge settlements remains highly valuable. The use of roads as Green Belt edges has led to higher landscape and visual impacts. The use of Green Belt road boundaries and resulting urban development and large industrial units on the settlement edges has reduced the visual separation of settlements.

Landscape sensitivity and capacity

9.24 As outlined in other chapters of this report, many features and areas within the Borough's landscape have been designated for their nature conservation,

heritage and other environmental value, and are key assets of Thurrock's landscape **[See reference 406]**. Thurrock has long been under pressure for development of industry, housing, transport and defensive sites, and there continues to be pressure for development due to Thurrock's prime location for trade and transport connections **[See reference 407]**.

9.25 A Thurrock Landscape Capacity Study was conducted in 2005 **[See reference** 408**]** with the purpose of assessing the landscape to accommodate potential development scenarios. The study concluded that, at strategic scale, much of the Borough's landscape is highly sensitive to most scales of urban development without substantial investment in green infrastructure provision. In more detail, it concludes that there is scope within the urban fringe and selected settlement edges to accommodate varying scales of development without significant adverse effects on important qualities of the landscape. The study also identifies a range of opportunities for positive enhancement and creation of green infrastructure within these development locations.

Landscape drivers for change

9.26 Within the **Greater Thames Estuary NCA**, there are several drivers for change that will put pressure on the flat estuary landscape. These include:

- New industrial complexes and major transport links such as the Lower Thames Crossing and Tilbury Energy Centre in Thurrock;
- Housing provision urban expansion within the main settlements;
- Major port developments such as Tilbury 2 and London Gateway;
- Increased tourism and recreation-related uses of the Estuary, such as nature parks, boating, water and jet skiing, new marinas, which may increase visitor pressure and reduce the feeling of remoteness and wilderness in some areas;
- Sea level rise is likely to result in significant losses of salt marsh and other habitats (including sand dunes, coastal vegetated shingle and mudflats) through coastal squeeze, with increased pressure on coastal defence

structures due to reduced wave attenuation by the salt marsh and pressure on active dynamic coastal processes;

- A substantial alteration of estuary morphology may occur due to changes in sedimentary processes, with extensive mudflats likely to become sandier, affecting composition of bird species, changes in community composition of estuarine habitats due to increased submergence levels and a continuing and potentially accelerating reduction in sediment supply to recharge shingle beach systems;
- Increased sedimentation and barrier breaches would result in the loss of saline lagoons. Increased saline intrusion would potentially result in a significant alteration to, and the loss of, other species and habitats, including a reduction in quality of coastal arable farmland;
- Likely impacts of climate change on grazing marsh habitat include the loss of species due to saline intrusion, drying out in summer, and unpredictable inundation due to wetter winters and more frequent storm events with increased silt loading and loss of breeding habitat for wetland birds; and
- A change in the arable landscape may also occur, with the appearance of species and crops adapted to new climatic conditions and a longer growing season potentially leading to double cropping.

9.27 Within the **Northern Thames Basin NCA**, drivers for change include:

- Continued urban expansion of settlements putting pressure on their landscape setting;
- Provision of new open space to improve health and wellbeing, which could lead to habitat fragmentation and an altered landscape character;
- Increased development of infrastructure (transport, logistics and industrial), particularly in proximity to the London area. The Lower Thames Crossing, which will run through the Thurrock area;
- Continued demand for minerals across South Essex;
- Climate change will lead to increased wind erosion in hotter and drier periods and water erosion in the wetter, colder periods;

- Loss of brownfield sites in developed areas putting pressure on invertebrate habitats; and
- Decreased water availability with potential loss of specific drought intolerant species and water quality of water bodies.

Projected baseline information

9.28 Significant future influences on Thurrock's landscape are likely to include major transport developments such as Lower Thames Crossing (LTC) and a continuation of the current urban regeneration programme, with the latter having more potential to be influenced by the Local Plan. This programme has already had an effect on Thurrock's landscape and townscape, with the expansion of retail services through Lakeside Shopping Centre, the creation of a huge container port at London Gateway, the regeneration of Purfleet, the continuation of the High House Production Park Housing, the Royal Opera House development and the expansion of the Port of Tilbury being key drivers for the change.

9.29 The proposed LTC route intersects the Borough and will undoubtedly have significant implications on areas of the rural landscape. The most significant impacts will be encroachment on the open countryside and the creation of a major enduring boundary within the Green Belt. In some cases, the proposed LTC route will provide a more defined barrier close to the boundaries of existing towns. The intervening land may become subject to increased development pressure as it may be viewed as less important to fulfilling the purposes of the Green Belt.

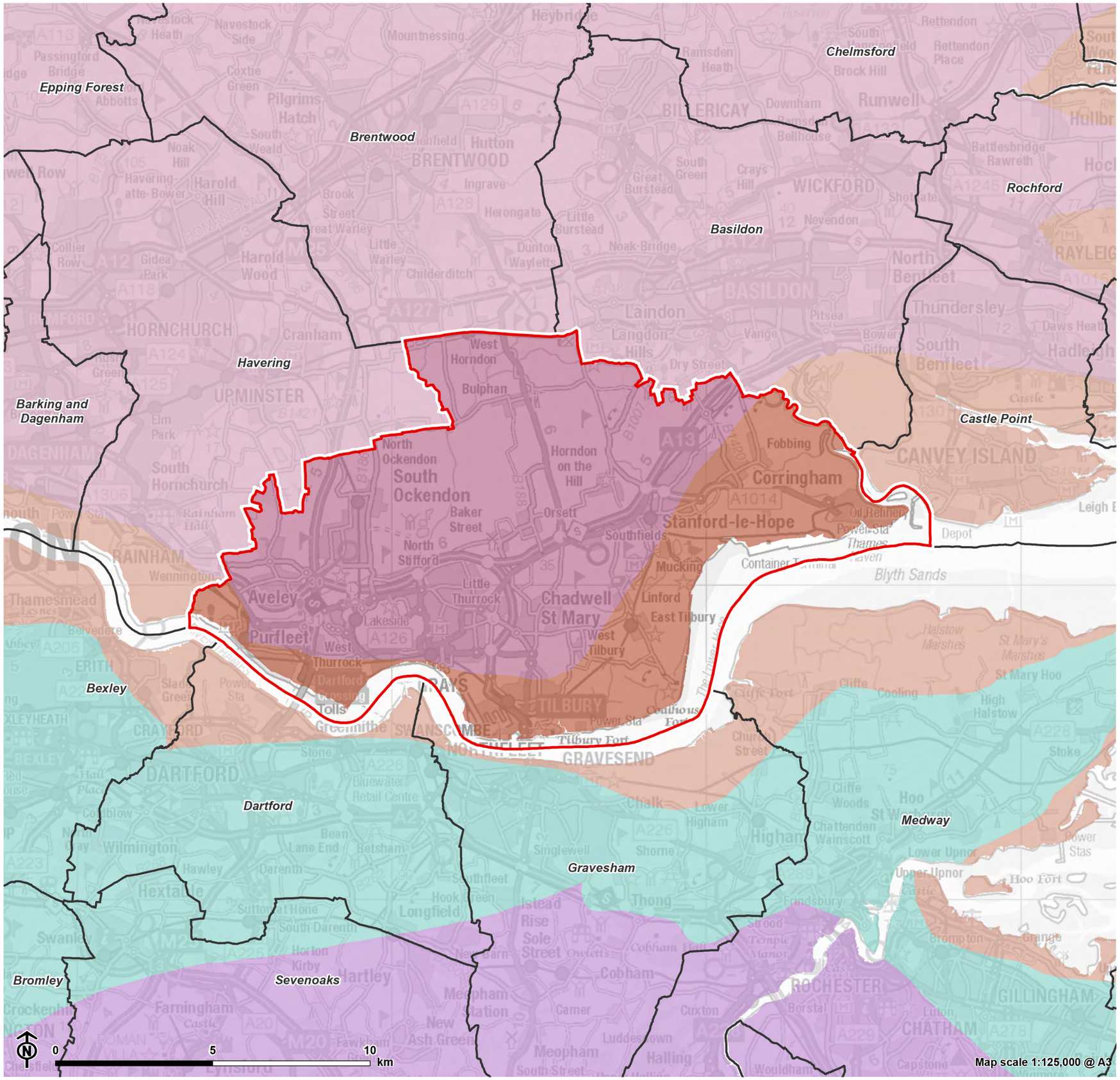
Implications for health

9.30 The landscape can benefit mental health and wellbeing in providing a pleasant setting and identifying and enhancing local landscape contributes to sense of place and belonging. Sensitive landscape management can also improve social and physical health by encouraging physical recreation,

including providing a pleasant environment for activities such as walking and cycling, providing good public access links and helping people to feel safe and confident in navigating landscapes.

LUC

Figure 9.1: National Character Areas



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Source: LUC, TC

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Key sustainability issues and likely evolution of these issues without the Local Plan

9.31 There continues to be pressure for development of industry, housing, transport and defensive sites and major developments such as the Lower Thames Crossing which have the potential to greatly affect the landscape character of the Borough. Thurrock contains national and local landscape character areas that may be left without protection and/or enhancement in the absence of the Local Plan and could be harmed by inappropriate development. The Local Plan offers an opportunity to ensure that the variation in landscape character is taken into account in the design and siting of development and opportunities for the protection and enhancement of the landscape are maximised.

9.32 The Green Belt plays a crucial role in checking urban sprawl and preserving the setting of towns and villages. However, the Green Belt is continuously under pressure from urban influences and to accommodate new development in the Borough, which can diminish the contribution that the landscape makes to maintaining the character of the Borough and its settlements. The Stage 1a and 1b Green Belt Assessment **[See reference** 409**]** and forthcoming Stage 2 Assessment will be taken into account during the preparation of the Local Plan when considering locations for meeting the objectively assessed need for housing and employment requirements in the Borough. Although land may be removed from the Green Belt to accommodate development, without the Local Plan, unmet housing and employment need would not be met. Furthermore, there would be pressure for development in the Green Belt in an unplanned way.

Chapter 10

Proposed framework for assessing significant effects

10.1 The development of a set of IIA objectives (known as the IIA Framework) is a recognised way in which the likely effects of the Local Plan can be described, analysed and compared. The IIA Framework for the Local Plan was originally established in the 2016 ISA Scoping Report and then updated in the 2018 ISA Issues and Options (Stage 2) Report. The IIA Framework presented overleaf is based on the framework presented in the 2018 ISA Report but has been reviewed and updated to take into account the latest baseline and key sustainability issues and opportunities identified for Thurrock, based on the analysis in the previous chapters of this Scoping Report; and reflecting targets and objectives set out in other relevant plans, programmes and strategies, as described in Chapters 2 to 9 of this Scoping Report. This update will help to ensure that the IIA of the Local Plan reflects recent global events (such as the COVID-19 pandemic), challenges and priorities, thereby helping to deliver an ambitious Plan.

10.2 The IIA objectives and appraisal guidance (which provide a guide to the factors that should be considered when carrying out assessments) set out in the IIA Framework are subject to change as new information comes to light during the IIA process.

10.3 The IIA Framework for the appraisal of policies is set out overleaf; each primary bullet point constitutes an IIA objective and the sub-bullet points set out further guidance to help guide the appraisal of each objective. The framework below also highlights the most relevant SEA topics for each IIA objective. This demonstrates that all SEA topics have been addressed through the IIA Framework.

IIA Framework for the Thurrock Local Plan

IIA objective 1: Housing

- IIA objective 1 – Provide new and affordable housing to meet identified needs of the whole community and provide housing of a suitable mix and type.
  - Does the Local Plan provide the amount and mix (size; tenures) of homes to meet local needs over the plan period?
  - Will it increase the range and affordability of housing to support the growing population and for all social groups?
  - Will the Local Plan address the housing needs of older people, disabled people and vulnerable groups e.g., accessible and adaptable housing, extra care housing or sheltered housing?
  - Does the distribution of housing reflect the expected distribution of need and main commuting patterns?
  - Does the Local Plan promote good design through layout, orientation and internal space standards?
  - Does the Local Plan promote delivery of new housing to lifetime homes specifications?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.
- Material assets.

IIA objective 2: Health, wellbeing and safety

- IIA objective 2 – Create a healthy living environment, encourage healthy lifestyles, enable people to stay independent, reduce inequalities in health, and improve safety.
  - Does the Local Plan promote physical activity and outdoor recreation by maintaining, connecting and creating a range of accessible, new, high quality, multifunctional open spaces, green and blue infrastructure, recreation, play and sports facilities?
  - Does the Local Plan facilitate access to high quality health facilities for all, including ensuring access to GPs and health centres with sufficient capacity to serve the local population?
  - Does the Local Plan protect physical and mental health and wellbeing by preventing, avoiding and mitigating adverse health effects associated with air pollution, noise, vibration, odour, and contamination of land and water?
  - Does the Local Plan promote healthy lifestyles by encouraging and facilitating walking and cycling?
  - Does the plan seek to reduce human exposure to air pollution from traffic emissions?
  - Does the Local Plan facilitate access to healthier food options, for example by retaining and providing allotments and avoiding an over-concentration of hot food takeaways, particularly in proximity to schools?
  - Does the Local Plan improve road safety, such as through traffic calming measures or better lighting?
  - Does the Local Plan promote access to safe, inclusive and accessible, open spaces, including for women and children, older persons and persons with disabilities?
  - Does the Local Plan promote accessibility to healthier food options and seek to restrict the density of unhealthy food outlets?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.

IIA objective 3: Community cohesion

- IIA objective 3 – Strengthen community cohesion and reduce inequalities.
  - Will the Local Plan help deliver cohesive neighbourhoods with high levels of pedestrian activity/outdoor interaction, where people mix?
  - Does the Local Plan seek to improve/supply community facilities in areas where there is need, ensuring easy and equitable access by sustainable modes of transport?
  - Does the Local Plan seek to facilitate the integration of new communities with existing communities by delivering a mix of supporting/other uses alongside housing development?
  - Will the Local Plan help to reduce levels of crime, anti-social behaviour and the fear of crime e.g. by including measures to increase safety and security of new development and public realm?
  - Will the Local Plan improve or expand facilities in areas that are amongst the 30% most deprived in the country?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.

IIA objective 4: Access to services and facilities

- IIA objective 4 – Ensure adequate access to services and facilities for all.

- Does the Local Plan reduce the need to travel to access essential services and facilities **[See reference** 410**]** by providing these close to new and growing communities and/or locating new housing close to existing services and facilities?
- Does the Local Plan support parking in appropriate locations to enable access to services and facilities for those with limited mobility?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.
- Material assets.

IIA objective 5: Equalities

- IIA objective 5 – Advance equality of opportunity and foster good relations between those who share a protected characteristic (Equality Act 2010) and those who do not.
  - Does the Local Plan remove or reduce disadvantages suffered by people due to their protected characteristics?
  - Does the Local Plan promote inclusive design, including making places accessible for people with limited mobility, neurodiversity and disabilities?
  - Does the Local Plan help meet the needs of people with certain protected characteristics (i.e. age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation.)?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.

IIA objective 6: Education and skills

- IIA objective 6 – Provide opportunities for high-quality education and skills development to allow everyone to achieve their potential.
  - Does the Local Plan provide education and skills development opportunities, particularly in deprived areas and accessible to all social groups?
  - Does the Local Plan improve the provision of education infrastructure and ensure that it meets projected future demand and need?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.
- Material assets.

IIA objective 7: Economy and employment

- IIA objective 7 – Facilitate a prosperous and growing economy that creates a range of new jobs and improves vitality and viability of town centres.
  - Does the Local Plan provide an adequate supply of land and infrastructure to meet the Borough's forecast employment needs with sufficient flexibility to respond to uncertainties and changing economic circumstances?
  - Does the Local Plan enable access to employment opportunities, particularly for disadvantaged groups and deprived areas?

- Does the Local Plan support opportunities for the expansion and diversification of business and inward investment?
- Does the Local Plan maintain and enhance the economic vitality and vibrancy of town centres by focusing development in or close to these centres?
- Does the Plan support an appropriate level of retail and other services in smaller service centres and rural areas?
- Does the Local Plan provide new and improved education and training facilities?
- Does the Local Plan support online business operations (e.g. internet sales and marketing), home working and professional and social connections e.g. through providing high speed broadband?

SEA Regulations topic(s) covered by IIA objective

- Population and human health.
- Material assets.

IIA objective 8: Transport

- IIA objective 8 – Reduce road traffic and congestion, pollution and accidents and improve health through physical activity by increasing the proportion of journeys made by public transport, cycling and walking.
  - Does the Local Plan encourage a modal shift to sustainable modes of transport by supporting maintenance and expansion of public and active transport networks?
  - Does the Local Plan support the provision and maintenance of facilities for electric vehicle charging and car-sharing?
  - Does the Local Plan promote a shift of freight from road to rail?

- Does the Local Plan reduce the need to travel by promoting the delivery of integrated, compact communities made-up of a complementary mix of land uses?
- Does the Local Plan help to address road congestion and its causes?

SEA Regulations topic(s) covered by IIA objective

- Air.
- Climatic factors.
- Population and human health.

IIA objective 9: Air quality

- IIA objective 9 – Improve air quality by reducing emissions and concentrations of harmful atmospheric pollutants.
  - Does the Local Plan improve air quality by minimising pollutant emissions from all sources, particularly within the AQMAs?
  - Does the Local Plan seek to avoid exacerbating existing air quality issues in designated AQMAs by locating development away from AQMAs and areas of poor air quality?
  - Does the Local Plan contribute to the achievement of objectives specified in Thurrock Air Quality Action Plans and the Thurrock Air Quality and Health Strategy 2016?
  - Does the Local Plan avoid adverse air quality effects on protected biodiversity sites (whether within or beyond the Authority area)?

SEA Regulations topic(s) covered by IIA objective

- Air.
- Population and human health.

IIA objective 10: Soils

- IIA objective 10 – Conserve and enhance Thurrock's soil resources.
  - Does the Local Plan help to maintain Thurrock's soil resources by prioritising development of brownfield/previously developed land over greenfield land?
  - Does the Local Plan avoid the loss of best and most versatile agricultural land?
  - Does the Local Plan facilitate the remediation of contaminated land, avoiding environmental pollution or exposure of occupiers or neighbouring land uses to unacceptable health risk?

SEA Regulations topic(s) covered by IIA objective

- Soil.
- Population and human health.

IIA objective 11: Resource consumption and waste

- IIA objective 11 – Use resources intelligently, optimising reuse and recovery to keep waste to a minimum.
  - Does the Local Plan avoid the sterilisation of mineral resources?

- Does the Local Plan safeguard mineral infrastructure, such as aggregate recycling facilities, wharfs and railheads?
- Does the Local Plan support the efficient use of natural resources, minimising waste and promoting appropriate waste management in line with the waste hierarchy?
- Does the Local Plan maximise energy efficiency and minimise the consumption of non-renewable energy i.e. from fossil fuels?
- Does the Local Plan minimise the consumption of water, land, soil, minerals, aggregates and other raw materials by all e.g. through integrated transport, sustainable resource-efficient design, local sourcing of food, goods, materials, etc?
- Does the Local Plan encourage the re-use/enhancement (to high standards of sustainable resource-efficient design) of existing buildings and promote the use of recycled and secondary materials in construction?

SEA Regulations topic(s) covered by IIA objective

- Material assets.

IIA objective 12: Water resources and quality

- IIA objective 12 – Ensure that water supply can support future development and preserve and enhance the quality of waterbodies and groundwater.
  - Does the Local Plan maintain or improve the quality of waterbodies?
  - Does the Local Plan minimise inappropriate development in groundwater source protection zones (SPZs)?
  - Does the Local Plan ensure there are sufficient water resources and waste water treatment capacity to accommodate new development?

- Does the Local Plan promote the efficient use of water, such as minimising water consumption and abstraction and by encouraging re-use of grey and rainwater?
- Does the Local Plan safeguard the quantity and quality of water at water-dependent protected biodiversity sites (whether within or beyond the Authority area)?

SEA Regulations topic(s) covered by IIA objective

- Water.

IIA objective 13: Climate change and energy

- IIA objective 13 – Reduce greenhouse gas emissions and encourage the transition to renewable energy.
  - Does the Local Plan minimise energy consumption and greenhouse gas emissions from transport, domestic, commercial and industrial sources?
  - Does the Local Plan promote energy efficiency by encouraging the use of energy efficient buildings and plant, and the use of renewable or low carbon energy sources in developments?
  - Does the Local Plan encourage the provision of renewable energy infrastructure in appropriate locations?
  - Does the Local Plan seek to build resilience and adapt to the impacts of climate change such as flood, drought, overheating, and extreme weather events particularly on groups more vulnerable to the effects of climate change?

SEA Regulations topic(s) covered by IIA objective

- Climatic factors.
- Air.

IIA objective 14: Flood risk

- IIA objective 14 – Reduce the risk and effects of flooding, both now and in the future.
  - Does the Local Plan avoid inappropriate types of development in areas at risk of surface, groundwater, fluvial and tidal flooding, taking into account the effects of climate change and mitigate residual risks via flood resilient design?
  - Does the Local Plan direct development away from areas at highest risk of flooding, but where development is necessary, make it safe without increasing flood risk elsewhere?
  - Does the Local Plan promote the use of SuDS, where appropriate?
  - Does the Local Plan safeguard human health and wellbeing by promoting climate change resilience through sustainable siting, design, landscaping and infrastructure?
  - Does the Local Plan identify, allocate and safeguard open space for flood storage, where appropriate?
  - Does the Local Plan encourage the creation, management and enhancement of a coherent green and blue infrastructure (GBI) network?

SEA Regulations topic(s) covered by IIA objective

- Climatic factors.

- Water.

IIA objective 15: Biodiversity and geodiversity

- IIA objective 15 – Conserve and enhance Thurrock's biodiversity and geology, including all statutory and non-statutory designated sites, priority habitats, and protected species.
  - Does the Local Plan conserve and enhance designated and undesignated ecological and geological assets?
  - Dose the Local Plan maintain and enhance the Nature Recovery Network of ecological assets and green/blue spaces, taking into account the impacts of climate change?
  - Does the Local Plan require that development delivers at least 10% net gains in biodiversity?
  - Does the Local Plan provide opportunities for the local community to interact with the natural environment and wildlife?

SEA Regulations topic(s) covered by IIA objective

- Biodiversity, flora and fauna.

IIA objective 16: Historic environment

- IIA objective 16 – Conserve and enhance the significant qualities, fabric, setting and accessibility of the historic environment.
  - Does the Local Plan conserve designated and undesignated heritage assets, including their setting and their contribution to wider local character and distinctiveness, avoiding adverse effects on their significance?

- Does the Plan outline opportunities for improvements to the conservation, management and enhancement of the historic environment, particularly at-risk heritage assets?
- Does the Local Plan promote access to, as well as enjoyment and understanding of, the local historic environment?

SEA Regulations topic(s) covered by IIA objective

- Cultural heritage, including architectural and archaeological heritage.

IIA objective 17: Landscape, townscape and visual impacts

- IIA objective 17 – Conserve and enhance Thurrock's landscape, seascape and townscape, ensuring development does not detract from the quality of views and local distinctiveness.
  - Does the Local Plan protect sensitive and special landscapes, seascapes and townscapes?
  - Does the Local Plan protect and enhance landscape character of the Borough?
  - Is the scale/density of development in keeping with important and valued features of the local landscape and seascape?
  - Does the Local Plan encourage high quality design principles to respect local character?
  - Does it seek to enhance the range and quality of the public realm and open spaces?
  - Will it reduce the amount of derelict, degraded and underused land?

SEA Regulations topic(s) covered by IIA objective

- Landscape.

Site Assessment Framework

10.4 IIA inevitably relies on an element of subjective judgement. However, in order to provide consistency and transparency in the appraisal of the site options, for each of the IIA objectives in the IIA Framework, a set of decision-making criteria and assumptions for determining the significance of effects has been developed for each of the IIA objectives in the IIA Framework. These criteria set out clear, mostly spatial, parameters within which defined effects would be recorded, based on factors such as the distance of site options from sensitive environmental receptors (e.g. designated biodiversity sites or areas of high landscape sensitivity) and distance to key services and facilities (e.g. service centres or public transport links). The criteria will be applied using spatial analysis of digital data sets within a Geographical Information System (GIS). Appendix B presents the draft Site Assessment Framework.

10.5 The draft Site Assessment Framework made reference to the framework presented in the 2018 ISA Report but has been redrafted to take into account updates to the scoping information, as identified in previous chapters of this Scoping Report, the consultation comments received on the previous ISA reports, and developing good practice. It should be noted that it may be necessary to refine the criteria and assumptions during the course of the IIA work, for example to respond to consultation comments, or to ensure that they remain appropriate with respect to the evidence base and the alternative options being considered for inclusion in the Local Plan.

10.6 It is important to note that while the results of the IIA are an important consideration in the selection of sites for development, they are by no means the only consideration. Economic viability, for example, is another key consideration which falls outside the remit of the IIA. A site could perform

exceptionally well from an IIA perspective but if it is economically unviable, it is unlikely to be developed, and thus may not be taken forward.

Predicting and evaluating effects

10.7 The prediction and evaluation of the effects of options in the Local Plan relies heavily on the IIA Framework and Site Assessment Framework – every policy and site option (and reasonable alternative) will be appraised for their likely impacts in relation to achievement of the IIA objectives. In line with the SEA Regulations, the following characteristics of effects will be predicted and evaluated:

- Probability;
- Duration, including short, medium and long-term impacts;
- Frequency;
- Reversibility;
- Cumulative and synergistic nature;
- Transboundary nature;
- Secondary nature;
- Permanent or temporary nature; and
- Positive or negative nature.

Probability

10.8 There is an inherent degree of uncertainty in carrying out an IIA. Should it be adopted, the Local Plan would likely be in force for several years. Over this time period, currently unforeseen changes are likely to occur. For example, any given community facility in Thurrock could potentially close down or move within a period of months, and thus an assessment which considers that a Local Plan policy or site would provide new residents with good access to this facility pre-

development, may not do so by the time construction begins. These circumstances are impossible to predict. The planning system is generally robust enough to deal with such changes by re-assessing the needs of sites and communities at the time applications are made. Uncertainties are dealt with in IIA by adopting a precautionary approach, wherein the worst-case scenario is assumed unless reliable evidence suggests otherwise. This is to ensure that any potentially significant negative effects are identified and appropriate consideration is given to how the Local Plan could help to avoid or mitigate the worst effects if such scenarios were to arise. However, it is accepted that the likelihood of many such worst-case scenarios occurring is low, particularly as the comprehensive array of policies proposed in the Local Plan would help to avoid or mitigate negative impacts.

10.9 The assessment of Local Plan options will indicate where particular uncertainties exist in relation to the effects identified.

Duration, including short, medium and long-term impacts

10.10 The temporal scope of the IIA covers the Local Plan period from 2022 to 2040. For the purposes of the IIA:

- Short term covers the period for 0-5 years, or during construction (inclusive of temporary impacts);
- Medium term covers the period for 5-20 years; and
- Long term covers the period over 20 years, beyond the Local Plan period.

10.11 Effects can occur over multiple terms, such as arising in the short-term and residing in the long-term.

Frequency

10.12 All effects of the Local Plan are considered to occur once, unless indicated otherwise.

Reversibility

10.13 The assessment will consider whether effects are reversible or irreversible. Reversible effects may be identified where a former mineral site is proposed for restoration to open space; irreversible effects may be identified where development is proposed on greenfield land thereby resulting in the loss of best and most versatile agricultural land.

Cumulative and synergistic effects

10.14 The IIA will provide an appraisal of all options in the Local Plan. The vision, strategic objectives, policies and site allocations of the Local Plan will not be adopted in isolation and therefore an evaluation of the cumulative and synergistic effects will be undertaken. Cumulative and synergistic effects are defined as follows:

- Cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect, or where several individual effects have a combined effect; and
- Synergistic effects interact to produce a total effect greater than the sum of the individual effects, so that the nature of the final impact is different to the nature of the individual impacts.

Transboundary effects

10.15 The geographical extent of effects will be experienced predominantly in Thurrock Borough (see Figure 1.1). However, where effects would be likely to be discernible in neighbouring authorities or at a scale greater than Thurrock, this will be specified. For example, transboundary effects may be experienced as housing provision and education can all result in flows of people across local authority boundaries. Furthermore, the high number of Thurrock residents commuting to other local authority areas for work, mainly by private car, is contributing to traffic congestion and poor air quality in the region.

Secondary effects

10.16 The assessment process inherently includes a consideration of secondary effects. Secondary effects are defined as “effects that are not a direct result but occur away from the original effect or as a result of a complex pathway”.

Permanent or temporary

10.17 The assessment will indicate whether effects are temporary or permanent in nature. Should the Local Plan be adopted, it would only be in place for the Plan period and would subsequently be replaced by a new Local Plan. Many of the effects of policies in the proposed Local Plan are therefore typically temporary effects. Nevertheless, a number of the effects of new development on a greenfield site would be likely to be permanent.

Positive and negative effects and significance

10.18 The IIA will evaluate whether the nature of effects is likely to be positive, negative, neutral or mixed. The magnitude of effects in relation to each IIA

objective will be defined as significant or minor. For example, a significant positive effect would be identified where an option is likely to significantly contribute to the achievement of an IIA objective, whereas an adverse effect (either significant or minor negative) would be identified where the option conflicts with the IIA objective. Options which are unlikely to significantly influence whether or not an objective will be achieved will receive a neutral rating. Mixed effects may be identified where an option is expected to have both a positive and negative effect on the IIA objective.

10.19 IIA assessment are carried out at a high level and so the dividing line between sustainability effects is often quite small. Significant effects will be distinguished from more minor effects using:

- The IIA Framework appraisal questions;
- The Site Assessment Framework assumptions and criteria; and
- Professional judgement, where necessary.

10.20 The effect of the option on the IIA objective will be considered to be significant where it is of such magnitude that it will have a noticeable and measurable effect compared with other factors that may influence the achievement of that IIA objective.

10.21 Minor effects will still be identified as these assist with the identification of cumulative and synergistic effects (e.g. several minor effects can combine to become a significant effect), can help to identify opportunities for enhancements (e.g. enhancing a minor positive effect to make it significant) and also better enable the Council to make a more informed decision over the sustainability performance of options.

10.22 In determining the significance of the effects of the options for potential inclusion in the Local Plan, the IIA will consider the Local Plan's relationship with the other documents in the planning system such as the NPPF and other national policy approaches, and regulatory requirements, as these may provide additional safeguards or mitigation of potentially significant adverse effects.

10.23 The findings of the IIA will be presented as a colour coded symbol showing a score for each option (including reasonable alternatives) against each of the IIA objectives along with a concise justification for the score given, where appropriate. The use of colour coding in the matrices will allow for the magnitude of effects (both positive and negative) to be easily identified. Table 10.1 presents the colour coded symbols and definitions that will be used to report the significance of effects of the Local Plan policies.

Table 10.1: IIA symbols and colour coding used in the scoring of effects for policies

IIA Effect	Description of Effect
++	Significant positive effect likely
++/-	Mixed significant positive and minor negative effects likely
+	Minor positive effect likely
+/-	Mixed minor effects likely
++/--	Mixed significant effects likely
-	Minor negative effect likely
--/+	Mixed significant negative and minor positive effects likely
--	Significant negative effect likely
0	No or negligible effect likely
?	Likely effect uncertain
N/A	Assessment criterion not applicable

10.24 A more streamlined framework of colour coded symbols and definitions is presented to illustrate the magnitude of effects of site options in relation to IIA objectives (see Table 10.2).

Table 10.2: IIA symbols and colour coding used in the scoring of effects for sites

IIA Effect	Description of Effect
++	Significant positive effect likely
+	Minor positive effect likely
-	Minor negative effect likely
--	Significant negative effect likely
0	No or negligible effect likely
?	Likely effect uncertain

Reasonable alternatives

10.25 The IIA must appraise not only the preferred options for inclusion in the Local Plan but also 'reasonable alternatives' to these options. This implies that alternatives that are not reasonable do not need to be subject to appraisal. Part (b) of Regulation 12(2) notes that reasonable alternatives will take into account the objectives of the plan, as well as its geographical scope. Therefore, alternatives that do not meet the objectives of national policy or are outside the Plan area are unlikely to be reasonable.

10.26 The objectives, policies and site allocations to be considered for inclusion within the Local Plan are in the process of being identified and reviewed. The Council's reasons for selecting the alternatives to be included in the Local Plan will be reported at a later stage in the IIA process.

‘Policy-off’ site appraisals and mitigation

10.27 The appraisal of potential site allocations will, initially, be on the basis of the criteria and assumptions set out in the draft Site Assessment Framework in Appendix B. This initial appraisal will be ‘policy-off’. This means that each site will be appraised based on the principle of development for the specified use within a defined site boundary and without taking into account opportunities to mitigate potential negative effects by, for example, providing new social infrastructure, by development design that seeks to minimise effects, or by site layouts that avoid sensitive environmental receptors within the site boundary.

10.28 This serves to highlight potential effects on the environment and potential gaps in existing services, facilities and sustainable transport links. This supports application of the mitigation hierarchy.

The mitigation hierarchy

The mitigation hierarchy is:

- Avoid
- Mitigate
- Compensate

10.29 This means it is preferable to avoid a significant negative effect occurring in the first instance than it is to mitigate a significant effect, and it is preferable to mitigate a significant effect than compensate for it, where mitigation is not possible.

10.30 The ‘policy off’ approach also provides a more consistent basis for assessment than reliance on indicative site masterplans or offers of infrastructure provision that some site promoters may have made because this information is extremely unlikely to be available for all site options.

Consideration by the IIA of any proposed site layouts would, in any case, also be inappropriately detailed in light of the relatively high level of detail contained in a Local Plan.

10.31 Once Local Plan site allocation policies are drafted, assessment scores for allocated sites will be revisited to reflect the Local Plan's site-specific policy requirements. In addition, once a complete draft of the Local Plan has been produced, assessment of the plan as a whole will take account of the mitigation offered by development management policies and regulatory mechanisms external to the plan. Mitigation may have the effect of reducing a significant negative effect to a minor or negligible effect, or it may result in a significant negative effect becoming a positive effect (e.g. where a new school is proposed as part of a development).

Health Impact Assessment

10.32 The background and overall approach to HIA is set out in Chapter 1. While the IIA Framework above identifies the most relevant SEA topic for each objective, many of the IIA objectives also have potential to impact the health and wellbeing of the population, as set out below:

- **IIA 1: Housing** – Provide new and affordable housing to meet identified needs.
  - Suitable, quality housing provides mental benefits of security and physical health benefits of having a healthy living environment.
- **IIA 2: Health, wellbeing and safety** – Create a healthy living environment, encourage healthy lifestyles and improve safety.
  - This objective directly addresses health and wellbeing.
- **IIA 3: Community cohesion** – Strengthen community cohesion and reduce inequalities.
  - Reducing crime, anti-social behaviour and fear of crime is important for physical and mental wellbeing.

- Creating cohesive neighbourhoods with high levels of pedestrian activity/outdoor interaction, ensures both physical and mental wellbeing.

- **IIA 4: Access to services and facilities** – Ensure adequate access to services and facilities for all.
  - Ensuring access to services and facilities means that people can access healthcare, recreation and sport facilities, and meet their daily needs, ensuring both physical and mental wellbeing.
- **IIA 5: Equalities** – Advance equality of opportunity and foster good relations between those who share a protected characteristic (Equality Act 2010) and those who do not.
  - Equality of opportunity ensures everyone can access the health and wellbeing services and facilities they need, as well as promoting a sense of inclusion.
- **IIA 6: Education and skills** – Provide opportunities for high-quality education and skills development to allow everyone to achieve their potential.
  - As well as providing mental stimulation and personal achievement, education is important in achieving employment goals.
- **IIA 7: Economy and employment** – Facilitate a prosperous and growing economy that creates a range of new jobs and improves vitality and viability of town centres.
  - Security of employment is important for mental wellbeing.
- **IIA 8: Transport** – Reduce road traffic and congestion, pollution and accidents and improve health through physical activity by increasing the proportion of journeys made by public transport, cycling and walking.
  - Encouraging active travel, such as waking and cycling can have a wider range of positive implications for health, including increased physical activity and opportunities for social interaction. In addition, an increase in active travel would be associated with a decrease in vehicular transport and an associated decrease in air pollutants that can be harmful to human health.

- **IIA 9: Air quality** – Improve air quality by reducing concentrations of harmful atmospheric pollutants and avoiding their emission.
  - Poor air quality can lead to and aggravate respiratory diseases.
- **IIA 10: Soils** – Conserve and enhance Thurrock's soil resources.
  - Contaminated land can be harmful to human health.
  - Best and most versatile land is important for food growing.
- **IIA 11: Resource consumption and waste** – Use resources intelligently, optimising reuse and recovery to keep waste to a minimum.
  - Sustainable use of resources ensures that resources are available for essential infrastructure, including transport, health centres and local amenities.
  - Optimising reuse and minimising waste also benefits the wider environment and the ecosystem services it provides.
- **IIA 12: Water resources and quality** – Ensure that water supply can support future development and preserve and enhance the quality of waterbodies and groundwater.
  - Availability of clean water is essential for drinking and sanitation.
- **IIA 13: Climate change and energy** – Reduce greenhouse gas emissions and encourage the transition to renewable energy.
  - Climate change impacts on health and wellbeing for example by increasing weather-related illnesses and accidents (such as heat strokes and storm damage), affecting food production and increasing the spread of disease.
- **IIA 14: Flood risk** – Reduce the risk and effects of flooding, both now and in the future.
  - Flooding can result in emotional and financial stress, as well as the spread of disease.
- **IIA 15: Biodiversity and geodiversity** – Conserve and enhance Thurrock's biodiversity and geology, including all statutory and non-statutory designated sites, notable and protected habitats and species.

- Well-functioning ecosystems provide a range of ecosystem services, including clean air and water, pollination of food crops and opportunities for recreation.
- Connection with nature can improve mental wellbeing.

- **IIA 16: Historic environment** – Conserve and enhance the significant qualities, fabric, setting and accessibility of the historic environment.
  - The historic environment can promote wellbeing by providing a sense of place, pride in the local area, and intellectual stimulation.
- **IIA 17: Landscape, townscape and visual impacts** – Conserve and enhance Thurrock's landscape and townscape, ensuring development does not detract from the quality of views and local distinctiveness.
  - The landscape and townscape can promote wellbeing by providing a sense of place, a sense of peace and beauty, interest and providing sites for recreation.

Equality Impact Assessment

10.33 There are three main duties set out in the Equality Act 2010, which public authorities including Thurrock Council must meet in exercising their functions:

- To eliminate discrimination, harassment, victimisation and other conduct that is prohibited under the Act;
- To advance equality of opportunity between persons who share relevant protected characteristics and persons who do not share it; and
- To foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

10.34 The Equality Act 2010 identifies nine 'protected characteristics' and seeks to protect people from discrimination on the basis of these characteristics. Socio-economic status (people on low incomes, young and adult carers, people living in deprived areas/rural areas, groups suffering multiple disadvantages etc.) is not a characteristic protected by the Equality Act 2010. However, the

Council is committed to also considering the impact that new policies changes will have on these groups.

10.35 The new Local Plan will therefore be assessed to consider the likely impacts of the site and policy options on each of the nine protected characteristics from the Equality Act 2010 as well the socio-economic groups considered to be of relevance to the assessment by the Council. The groups against which the Local Plan options will be considered are as follows:

- Protected characteristics identified in the Equality Act 2010:
  - Age: Children (0-4), Younger people (aged 18-24), older people (aged 60 and over);
  - Disability: Disabled people, people with physical and mental impairment;
  - Gender reassignment;
  - Marriage and civil partnership;
  - Pregnancy and maternity;
  - Race;
  - Religion or belief;
  - Sex; and
  - Sexual orientation.
- Socio-economic status groups highlighted for consideration by Thurrock Council:
  - People on low incomes, young and adult carers, people living in deprived areas/rural areas, groups suffering multiple disadvantages.

Chapter 11

Conclusion and next steps

11.1 This document has presented a review of the policy context, sustainability baseline and key sustainability issues relevant to the IIA of the emerging Thurrock Local Plan. It also sets out an updated IIA Framework to guide the assessment of policies and sites considered for the Local Plan (including reasonable alternatives).

11.2 In order to meet the requirements of the SEA Regulations, the views of the three statutory consultees (Environment Agency, Historic England and Natural England) have been sought in relation to the scope and level of detail included in the IIA Report. Consultation was undertaken on the IIA Scoping Report between 17th May and 21st June 2022. The consultees were requested to consider, in particular:

- Whether the proposed scope of the IIA is appropriate, considering the role of the Local Plan to help meet and manage Thurrock's needs;
- Whether there are any additional plans, policies or programmes that are relevant to the IIA that should be included;
- Whether the baseline information provided is robust and provides a suitable baseline for the IIA of the Local Plan;
- Whether there are any additional sustainability issues relevant to the Local Plan and IIA that should be included; and
- Whether the IIA Framework is appropriate and includes a suitable set of IIA objectives for assessing the effects of the options considered through the Local Plan process.

11.3 Responses from consultees have been reviewed and amendments made to the baseline, policy context and IIA Framework, as appropriate. The next stage of the IIA will be the appraisal of the Regulation 18 version of the Thurrock Local Plan.

Appendix A

Consultation comments received in relation to IIA Scoping Report

A.1 The three consultation bodies for SEA in England, namely Historic England, Natural England and the Environment Agency, were consulted on a draft of the IIA Scoping Report from 17th May to 21st June 2022. A summary of the comments and LUC's responses to these is provided below:

Historic England

Historic England response

- The Scoping Report has identified the relevant plans and programmes to the development of the Thurrock Local Plan, has established a robust baseline and sets out an appropriate framework and IIA objectives against which the effects of proposals on the historic environment can be assessed. Overall, it provides an appropriate basis for assessing the significant effects of the emerging Local Plan on the historic environment.
- We often see SA's concluding 'uncertain effects' in relation to sites – this is because there isn't sufficient information to understand what impact development would have on their significance. Paragraphs 199 and 200 of NPPF make it clear that great weight should be given to the asset's conservation. To this end we are pleased to see this issue acknowledged and addressed (paragraphs A.42 and Table A.13).

LUC Response

Noted.

- In order to demonstrate that an allocation is compatible with the requirements of NPPF, as part of the Evidence Base underpinning the Plan there needs to be an assessment (Heritage Impact Assessment (HIA)) of what contribution the currently-undeveloped sites makes to those elements which contribute to the significance of nearby heritage assets and what effect the loss of this site and its subsequent development might have upon their significance. This should be proportionate and inform appraisal of sites in the IIA. Whilst a high-level HIA may be sufficient for some sites, it is likely that some will require more detailed assessment.
- Historic England's Advice Note 3 ('The Historic Environment and Site Allocation in Local Plans') sets out a suggested approach for assessing sites and their impact on heritage assets. This could be applied to the assessment and selecting of sites within the Thurrock Local Plan. It is important that the Council:
  - Identify any heritage assets that may be affected by site allocation;
  - Understand what contribution the site makes to the significance of asset(s);
  - Identify what impact allocation might have on that significance;
  - Consider maximising enhancements and avoiding harm; and
  - Determine whether the proposed allocation is appropriate in light of NPPF's tests of soundness.
- If a site is allocated, we would expect to see reference in the policy and supporting text to the need to conserve and seek opportunities to enhance the significance of on-site or nearby heritage assets, the need for high quality design and any other effects to the historic environment.

LUC Response

Noted.

- Historic England strongly advises that the conservation and archaeological team of your authority are closely involved throughout the preparation of the IIA of this Plan.

LUC Response

Noted.

Natural England

Natural England response

Is the proposed scope of the IIA appropriate, considering the role of the Local Plan to help meet and manage Thurrock's needs?

- The range of topics to be considered within the IIA is generally considered appropriate.
- As the Scoping Report does not identify the spatial planning consequences of predicted growth during the plan period (i.e. what is the likely location of housing growth/employment growth/infrastructure provision), the implications of the Local Plan for the natural environment are not evident at this stage. This means that the consideration of 'key sustainability issues' within each topic chapter is a rather abstract

exercise. The spatial planning implications of the Local Plan will become clearer at the preferred options stage and this will need to be reflected in the IIA as it develops in tandem.

LUC Response

Noted.

- The Introduction to the Scoping Report sets out the principles that will guide and underpin the Local Plan and it is a concern that these do not include any reference to the conservation and enhancement of the natural environment as required by NPPF (paras 174a, 149).

LUC Response

Noted. The Local Plan's guiding principles are reproduced from the Issues and Options (Stage 2) document that was consulted on from December 2018 to March 2019. Council to consider whether it wishes to amend these principles to reflect Natural England's comment when preparing the next iteration of the Local Plan document.

- The Scoping Report seems to identify the social implications of the Local Plan as the predominant focus rather than clearly integrating the social, environmental and economic considerations. For example, the key sustainability issues raised within the transport chapter and the air, land and water chapter don't include the risks to the natural environment. This could be addressed by expanding the scope of the biodiversity chapter to 'Biodiversity and Natural Environment'.

LUC Response

Amendments have been made to the transport and the air, land and water chapters to ensure risks to the natural environment are clearly identified.

- The Scoping Report makes it clear that the IIA does not incorporate the Habitats Regulations Assessment (HRA) of the emerging Local Plan as this will be developed as a separate exercise. As noted above, the environmental considerations of the Local Plan could be better integrated within the IIA and publishing the HRA concurrently might have helped in this respect. Nevertheless, the Scoping Report confirms that likely significant effects of the emerging Local Plan on the environment will be addressed at a later stage in the IIA process so the integration of social, environmental and economic issues should become clearer at that stage.

LUC Response

Noted.

- Depending on the scale and location of planned development there is the potential for the emerging Local Plan to give rise to environmental impacts that extend beyond Thurrock Council's administrative boundary. The potential for cross-boundary impacts does not appear to have been fully addressed in the scope of the IIA. Whilst specific spatial planning impacts have yet to emerge, the potential for cross-boundary impacts should be acknowledged at this stage.

LUC Response

The IIA will seek to identify the significant effects of the Local Plan regardless of where they arise, including beyond the administrative

boundary. Changes have been made to the guiding questions of the IIA Framework to make this explicit in relation to potential air quality and water quality effects on protected biodiversity sites.

Are there any additional plans, policies or programmes that are relevant to the IIA that should be included?

- I could not find references to the emerging or adopted Local Plans for neighbouring Local Planning Authorities (and the relevant evidence base) which will need to be considered in relation to cross-boundary issues and the Duty to Cooperate.

LUC Response

The policy context section for each topic chapter includes review of relevant sub-regional plans, policies and programmes, including for South Essex, Essex and the wider East region. The baseline information section for each chapter also draws on wider than district information, such as River Basin Management Plans. Should the IIA identify the potential for significant environmental effects at particular locations beyond the administrative boundary then appropriate consideration will be given at that time to the current state of the environment and its likely future evolution (including as a result of local planning policies) in those neighbouring areas.

Is the basline information robust and provides a suitable baseline for the IIA of the Local Plan?

- The baseline information seems to be extensive. There are some areas where the baseline information could be enhanced:
  - In relation to information on air quality, the Air Pollution Information System (APIS) should be interrogated for information on pollutants and their impacts for habitats and species at protected sites.
  - In relation to green infrastructure, useful evidence on local provision is available through the England Green Infrastructure Mapping Database, Natural England's Introduction to Green Infrastructure Framework and National England's Accessible Natural Greenspace Standards.
  - In relation to Soils, the baseline information (Figure 5.2) classifies agricultural land within grades 1-5. The classification will need to distinguish between areas within Grade 3a and 3b to establish the extent of agricultural land classed as Best and Most versatile (Grades 1, 2 and 3a).

LUC Response

Noted with thanks.

Are any additional sustainability issues relevant to the Local Plan and IIA that should be included?

- The IIA needs to fully explore the impacts of the Local Plan upon the natural environment. Recommendations are set out in response to question 5 below.

LUC Response

In relation to information on air quality, a description has been added to the baseline section of the air, land and water quality chapter of the types of effect that relevant air pollutants may have on the natural environment, drawing on information in APIS.

In relation to green infrastructure, information has been added to the baseline section of the biodiversity chapter on local provision of natural greenspace.

In relation to soils, information is not available for the Plan area to sub-divide Grade 3 agricultural land into Grades 3a and 3b.

Is the IIA Framework appropriate and does it include a suitable set out IIA objectives for assessign the effects of the options considered through the Local Plan process?

- Natural England recommends the following additions to the proposed set out IIA objectives:
  - Objective 1: Housing. Recommend the addition of objective to ensure that consideration is given to the impact of new housing (siting of allocations) on the natural environment (protected sites and priority habitats and species);
  - Objective 7: Economy and Employment. Recommend the addition of an objective to ensure considerations is given to the impact of employment allocations on the natural environment (protected sites and priority habitats and species);

- Objective 9: Air Quality. Recommend the addition of an objective to ensure that the Local Plan does not cause adverse effects upon air quality at protected sites (within or beyond the Authority area);
- Objective 12: Water Resources and Quality. Recommend the addition of an objective to ensure that the Local Plan safeguards the quantity and quality of water at water-dependent protected sites (whether within or beyond the Authority area).
- Objective 15: Biodiversity and Geodiversity. Recommend the deletion of "where appropriate" in the first objective as national planning policy (NPPF) requires that Plans conserve and enhance the natural environment.
- Objective 17: Landscape, Townscape and Visual Impacts. Recommend that the objectives address "seascapes" as well as "landscapes".

LUC Response

The recommended changes to IIA objectives 9, 12, 15 and 17 have been made in the proposed framework for assessing significant effects chapter. No changes have been made to IIA objectives 1 or 7 since the potential for all aspects of the Local Plan, including housing allocations and employment allocations, to affect protected sites and priority habitats and species is already assessed under IIA objective 15: Biodiversity and geodiversity.

Environment Agency

- No response received.

Appendix B

Draft Site Assessment Framework

B.1 The draft Site Assesment Framework is designed to identify the potential for significant effects of development at a particular site, and to ensure that all sites are appraised consistently, objectively and using a transparent methodology.

B.2 Reference is made to distances in the draft Site Assesment Framework . The most sustainable and easily achievable mode of transport is walking, and the distances relate to walking distances.

B.3 There are a number of pieces of research that give a variety of recommended guidance distances for walking. For example, the Institute of Highways and Transportation found that the average length of a walk journey is one kilometre. The Institute of Highways and Transportation categorises distances depending upon location and purpose of the trip, and 'desirable', 'acceptable', and 'preferred maximum' (see Table B.1).

Table B.1: Institute of Highways and Transportation walking distances

	Town Centres (m)	Commuting/School/Sight-seeing (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1,000	800
Preferred maximum	800	2,000	1,200

B.4 For the purposes of the appraisal, distances in the appraisal will be measured as the straight line distance from the edge of the site option to existing services and facilities, and therefore actual walking distances are likely

to be greater (e.g. depending on the house location within a larger site and the availability of a direct route).

B.5 Given the wide range of services and facilities normally considered in IIAs, LUC has developed some guideline distances that it uses in its IIA work, which are reflected in the draft Site Assessment Framework for the Thurrock Local Plan. These are outlined in Table B.2.

Table B.2: Walking distance assumptions

Site Assessment Criterion: Proximity to…	Desirable	Acceptable	Preferred Maximum
GP surgeries/health centres	<= 400m	401-800m	801-1,200m
Primary or middle schools	<= 400m	401-800m	801-1,200m
Secondary schools	<= 500m	501-1,000m	1001-2,000m
Further and higher education facilities	<= 500m	501-1,000m	1001-2,000m
Local centres	<= 200m	201-400m	401-800m
Town centres	<= 400m	401-800m	801-1,200m
Railway stations	<= 500m	501-1,000m	1001-2,000m
Bus stops	<= 200m	201-400m	401-800m
Cycle paths	<= 200m	201-400m	401-800m
Open spaces and sports centres	<= 400m	401-800m	801-1,200 m
Public rights of way (PRoW)	<= 200m	201-400m	401-800m

IIA objective 1: Housing

B.6 IIA objective 1 was scoped out of the appraisal of residential site options. Performance of the Local Plan in relation to this IIA objective relates to factors such as its ability to deliver the right types and tenures of housing at prices that people can afford, as well as addressing the needs of specialist groups and promoting good design principles. These factors do not depend on the location of the site and will be taken into account by the IIA through appraisal of development management policies and site-specific requirements set out in allocation policies.

IIA objective 2: Health, wellbeing and safety

B.7 The effects of site options in relation to IIA objective 2 will be tested by spatial analysis of their proximity to areas likely to have negative (e.g. high levels of noise pollution) or positive (e.g. access to open space) effects on health and wellbeing.

B.8 Footpath and cycle path networks are more likely to constitute a recreational resource if they are in or easily link to rural areas but those in urban areas may be important for commuting by active modes therefore both will be considered.

B.9 It is assumed that any area of open space within a site would be lost to development with negative effects on this IIA objective. However, it is also possible that the design of new developments may allow for the incorporation of open space. It is assumed that any existing PRoW or cycle path crossing a site would be retained, diverting its route if necessary, in line with national legislation.

B.10 If there are any sites with particular access issues due to the topography of the site or the presence of barriers such as main roads, this will be taken into account in the appraisal. Therefore, in some cases sites that are within 800m of a GP surgery or area of open space or within 400m of a PRoWs/cycle route will score a minor negative effect.

B.11 Many other factors within the scope of the Local Plan could affect the achievement of this IIA objective but these will be tested by the IIA of Local Plan policies (for instance in relation to the provision of new or enhancement to existing healthcare facilities/open spaces/sports and recreation facilities, and designing sites that are safe, inclusive and accessible, etc.).

Significance scoring for IIA objective 2 criteria

Each criterion will score:

- Major positive +3
- Minor positive +1
- Negligible 0
- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2

- Significant negative >= -2

Table B.3: IIA draft site assessment criteria for IIA objective 2

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
2a AQMAs	N/A	N/A	All other sites	Site <=500m from an AQMA	Site within an AQMA	N/A	Air Quality Management Areas
2b Noise pollution from roads, railways, ports	N/A	N/A	All other sites	Lnight 50.0-54.9 dB or Laeq,16 55.0-59.9 dB	Lnight >=55.0 dB or Laeq,16 >=60.0 dB	N/A	Strategic noise mapping
2c Odour from waste facilities	N/A	N/A	All other sites	N/A	<=400m to wastewater treatment works or <=500m to anaerobic digestion (AD) facility or <=250m to waste management facility	N/A	Waste water treatment works Waste Management Sites
2d GP surgeries	<=400m from nearest NHS GP surgery	401-800m from nearest NHS GP surgery	N/A	801-1,200m from nearest NHS GP surgery	>1,200m from nearest NHS GP surgery	N/A	GP surgeries (excludes opticians, pharmacies, hospitals, any private healthcare facilities)
2e Open space	<=400m from open space, open country or registered common land	401-800m from open space, open country or registered common land	N/A	801-1,200m from open space, open country or registered common land or Loss of open space, open country or registered common land (<25% development site area)	>1,200m from open space, open country or registered common land or Loss of open space, open country or registered common land (>=25% development site area)	N/A	Open spaces (from TC) Open country Registered common land
2f Public Rights of Way (PRoW)/Cycle paths	<=200m from PRoW/Cycle paths	201-400m from PRoW/Cycle paths	N/A	401-800m from PRoW/Cycle paths	>800m from PRoW/Cycle paths	N/A	PRoW Cycle paths

IIA objective 3: Community cohesion

B.12 IIA objective 3 was scoped out of the appraisal of site options. Performance of the Local Plan in relation to this IIA objective relates to factors such as its ability to deliver development that integrates well with existing neighbourhoods, that meets the needs of specific groups, that will benefit both new residents and existing ones, that is designed to provide spaces for informal interaction, and that is designed to reduce crime and the fear of crime. These factors do not depend on the location of the site and will be taken into account by the IIA through appraisal of development management policies and site-specific requirements set out in allocation policies.

IIA objective 4: Access to services and facilities

B.13 The effects of site options in relation to IIA objective 4 will be tested by analysis of their proximity to essential services and facilities, public transport, active travel routes, open spaces, and employment sites. It is considered that there is more limited potential for travel patterns to be greatly influenced by proximity of employment site options to services and facilities. These sites will be considered making use of 2011 Census data available on the method of travel to work by Middle-layer Super Output Area (MSOA).

B.14 People often travel much longer distances to access employment than other services and facilities and there is no guarantee that a major employment site close to where people live will offer jobs that are suited to those local residents. Rather than proximity to major employment sites, accessibility of residential sites allocations to employment will be appraised by reference to 2011 Census data indicating the main commuting destinations from each MSOA in the plan area. Residential development in areas with relatively low average commuting distances will be rated as having better access to

employment than residential development in areas with relatively high average commuting distances. Note that detailed Census 2021 data is not expected to be available until March 2023 and in any case is not likely to be representative of long-term commuting trends due to the COVID-19 restrictions in place on Census day (21/3/21).

B.15 Other aspects of the Local Plan affecting access to services and facilities will be assessed via the IIA of development management policies, for example requirements to provide parking in appropriate locations to enable access to services and facilities for those with limited mobility.

Significance scoring for IIA objective 4 criteria (excluding employment sites 4l and 4m)

Each criterion will score:

- Major positive +3
- Minor positive +1
- Negligible 0
- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2

- Significant negative >= -2

Significance scoring for employment sites 4l and 4m

If the criterion scores major positive then the significance of the effect of the site vs. the IIA objective will be significant positive.

If the criterion scores minor positive then the significance of the effect vs. the IIA objective will be minor positive.

If the criterion scores major negative then the significance of the effect vs. the IIA objective will be significant negative.

If the criterion scores minor negative then the significance of the effect vs. the IIA objective will be minor negative.

All other sites will have a negligible effect vs. the IIA objective.

Table B.4: IIA draft site assessment criteria for IIA objective 4

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
4a GP surgeries	<=400m from nearest NHS GP surgery	401-800m from nearest NHS GP surgery	N/A	801-1,200m from nearest NHS GP surgery	>1,200m from nearest NHS GP surgery	N/A	GP surgeries (excludes opticians, pharmacies, hospitals, any private healthcare facilities)
4b Primary schools	<=400m from primary school	401-800m from primary school	N/A	801-1,200m from primary school	>1,200m from primary school	N/A	Primary schools (excludes private schools)
4c Secondary schools	<=500m from secondary school	501-1,000m from secondary school	N/A	1,001-2,000m from secondary school	>2,000m from secondary school	N/A	Secondary schools (excludes private schools)
4d Further and higher education facilities	<=500m from further and higher education facility	501-1,000m from further and higher education facility	N/A	1,001-2,000m from further and higher education facility	>2,000m from further and higher education facility	N/A	Further and higher education facilities
4e Town centres	<=400m from town centre	401-800m from town centre	N/A	801-1,200m from town centre	>1,200m from town centre	N/A	Town centres (Grays, Lakeside (proposed new town centre))
4f Local centres	<=200m from local centre	201-400m from local centre	N/A	401-800m from local centre	>800m from local centre	N/A	Local centres (Corringham, South Ockendon, Stanford-le-Hope, Tilbury, Aveley, Socketts Heath)
4g Rail	<=500m from a railway station	501-1,000m from a railway station	N/A	1,001-2,000m from a railway station	>2,000m from a railway station	N/A	Railway stations
4h Bus	<=200m from a bus stop	201-400m from a bus stop	N/A	401-800m from a bus stop	>800m from a bus stop	N/A	Bus stops
4i Public Rights of Way (PRoW)/Cycle paths	<=200m from PRoW/Cycle paths	201-400m from PRoW/Cycle paths	N/A	401-800m from PRoW/Cycle paths	>800m from PRoW/Cycle paths	N/A	PRoW Cycle paths
4j Open space	<=400m from open space, open country or registered common land	401-800m from open space, open country or registered common land	N/A	801-1,200m from open space, open country or registered common land or	>1,200m from open space, open country or registered common land or	N/A	Open spaces

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
				Loss of one of these (<25% development site area)	Loss of one of these (>=25% development site area)		
4k Employment	Sites in areas where average commuting distance is in lowest 20% of distances for the plan area	Site in areas where average commuting distance is in 20-40% range for the plan area	Sites in areas where average commuting distance is in 40-60% range for the plan area	Sites in areas where average commuting distance is in 60-80% range for the plan area	Sites in areas where average commuting distance is in 80-100% range for the plan area	N/A	2011 Census travel to work data (relative performance to be confirmed once distribution of commuting distances from the plan area is known)
For employment sites 4l potential for a large proportion of trips to be undertaken by more sustainable modes	Sites in areas where 40-50% of commuters to that area use public transport or active modes	Sites in areas where 30-40% of commuters to that area use public transport or active modes	Sites in areas where 20-30% of commuters to that area use public transport or active modes	Sites in areas where 10-20% of commuters to that area use public transport or active modes	Sites in areas where 0-10% of commuters to that area use public transport or active modes	N/A	2011 Census travel to work data (WU03EW – Location of usual residence and place of work by method of travel to work (MSOA level))
For employment sites 4m potential for a large proportion of trips to be undertaken by more sustainable modes	Sites in areas where 40-50% of commuters to that area use public transport or active modes	Sites in areas where 30-40% of commuters to that area use public transport or active modes	Sites in areas where 20-30% of commuters to that area use public transport or active modes	Sites in areas where 10-20% of commuters to that area use public transport or active modes	Sites in areas where 0-10% of commuters to that area use public transport or active modes	N/A	2011 Census travel to work data (WU03EW – Location of usual residence and place of work by method of travel to work (MSOA level))

IIA objective 5: Equalities

B.16 IIA objective 5 was scoped out of the appraisal of site options. Performance of the Local Plan in relation to this IIA objective relates to factors such as its ability to deliver development that will remove or reduce disadvantages suffered by people due to their protected characteristics, and that is designed to promote inclusivity and accessibility for people with limited mobility, neurodiversity and disabilities. These factors do not depend on the location of the site and will be taken into account by the IIA through appraisal of development management policies and site-specific requirements set out in allocation policies.

IIA objective 6: Education and skills

B.17 IIA 6 will be appraised based on the the proximity of residential sites to schools and further/higher education facilities. Employment sites within one of the 20% most deprived areas (according to the 'Education, Skills and Training Deprivation' domain in the Index of Multiple Deprivation 2019) will provide skills and training opportunities in the most deprived areas in the Borough.

B.18 Many other factors within the scope of the Local Plan could affect the achievement of this IIA objective but these will be tested by the IIA of Local Plan policies (for instance in relation to the provision of new or enhancement to existing education facilities).

Significance scoring for IIA objective 6 criteria

Each criterion will score:

- Major positive +3
- Minor positive +1
- Negligible 0
- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2
- Significant negative >= -2

Table B.5: IIA draft site assessment criteria for IIA objective 6

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
6a Primary schools	<=400m from primary school	401-800m from primary school	N/A	801-1,200m from primary school	>1,200m from primary school	N/A	Primary schools (excludes private schools)
6b Secondary schools	<=500m from secondary school	501-1,000m from secondary school	N/A	1,001-2,000m from secondary school	>2,000m from secondary school	N/A	Secondary schools (excludes private schools)
6c Further and higher education facilities	<=500m from further and higher education facility	501-1,000m from further and higher education facility	N/A	1,001-2,000m from further and higher education facility	>2,000m from further and higher education facility	N/A	Further and higher education facilities
6d Education, skills and training deprivation	Employment site located within on of the 20% most deprived areas within the Borough	All other employment sites	N/A	N/A	N/A	N/A	Index of Multiple Deprivation 2019 ('Education, Skills and Training Deprivation' domain of IMD 2019)

IIA objective 7: Economy and employment

B.19 Potential negative effects will be identified where the allocation of a residential site would lead to the loss of an existing employment use at the site but IIA objective 7 was otherwise scoped out of the appraisal of residential site options. Effects for all residential sites (including negative effects identified for sites presently supporting an employment use) will be uncertain, given that they are based on information provided by site promoters on the call for sites forms, which have not always been completed to the same level of detail.

B.20 The development of employment land will have a direct positive effect on this IIA objective as it supports the provision of appropriate sites for new business opportunities. Larger sites offer greater potential to accommodate a variety of businesses which is likely to help improve the resilience of the economy and diversity of businesses. Furthermore, new employment development should result in improved opportunities for work-based training and skills development. The extent of the positive impact will be affected by the size of the employment site as larger sites are likely to offer particularly good opportunities for higher numbers of people to gain employment and to obtain new skills and training opportunities. The size thresholds of sites (i.e. large or small sites) will be determined by the range of sites proposed by the Council and will be defined at the next stage of the IIA.

B.21 Employment sites within one of the 20% most deprived areas (according to the 'Employment Deprivation' domain in the Index of Multiple Deprivation 2019) will provide employment opportunities in the most deprived areas in the Borough.

B.22 Employment and residential sites in town and local centres offer opportunities to enhance the vitality and viability of these areas.

B.23 The accessibility of residential sites to employment opportunities is addressed under IIA objectives 4 and 8. The provision of new homes across the plan area will create job opportunities, particularly during the construction phase, but this will not vary between site locations.

B.24 Other aspects of the Local Plan affecting the economy and employment provision will be assessed via the IIA of development management policies, for example requirements to support online business operations and home working.

Significance scoring for IIA objective 7 criteria

Each criterion will score:

- Major positive +3
- Minor positive +1
- Negligible 0
- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2
- Significant negative >= -2

Table B.6: IIA draft site assessment criteria for IIA objective 7

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
7a Existing employment land (for residential sites)	N/A	N/A	Site not in existing employment use	N/A	Site in existing employment use	All effects are uncertain	Existing use
7b Employment provision	TBC (size threshold of 'large' employment sites will be defined in the next stage of the IIA)	TBC (Size threshold of 'small' employment sites will be defined in the next stage of the IIA)	N/A	N/A	N/A	N/A	Proposed employment site options
7c Employment deprivation	Employment site located within one of the 20% most deprived areas within the Borough	All other employment sites	N/A	N/A	N/A	N/A	Index of Multiple Deprivation 2019 ('Employment Deprivation' domain of IMD 2019)
7d Viability and vitality of town centres	<=400m from town centre	401-800m from town centre	N/A	801-1,200m from town centre	>1,200m from town centre	N/A	Town centres (Grays, Lakeside (proposed new town centre))
7e Viability and vitality of local centres	<=200m from local centre	201-400m from local centre	N/A	401-800m from local centre	>800m from local centre	N/A	Local centres (Corringham, South Ockendon, Stanford-le-Hope, Tilbury, Aveley, Socketts Heath)

IIA objective 8: Transport

B.25 The effects of site options in relation to IIA objective 8 will be tested by spatial analysis of their access to essential services and facilities, public transport, active travel routes, open spaces, and employment sites. The same criteria will be applied and the same IIA scores will be reported as for IIA objectives 4 and 13.

B.26 Other aspects of the Local Plan affecting transport will be assessed via the IIA of development management policies, for example requirements to provide electric vehicle charging facilities.

IIA objective 9: Air quality

B.27 Thurrock currently has 18 Air Quality Management Areas (AQMAs). These are located mainly in the west of the Borough, close to major transport routes such as the M25 and A13 and are a result of traffic related pollution along busy roads used for commuter traffic or logistical purposes. The proximity of sites to AQMAs does not robustly test the potential for such sites to generate road traffic and associated emissions in AQMAs. Therefore, the proximity of sites to AQMAs will be used as an initial indicator of likely adverse impacts on air quality, however, as the evidence base of the Local Plan develops, which is likely to include transport and air quality modelling, this will be used to inform the appraisal of the total effects of the Council's preferred spatial strategy and site allocations.

Significance scoring for IIA objective 9 criteria

If the criterion scores major negative then the significance of the effect of the site vs. the IIA objective will be significant negative.

If the criterion scores minor negative then the significance of the effect vs. the IIA objective will be minor negative.

All other sites will have a negligible effect vs. the IIA objective.

Table B.7: IIA draft site assessment criteria for IIA objective 9

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
9a AQMAs	N/A	N/A	All other sites	Site <=500m from an AQMA	Site within an AQMA	N/A	Air Quality Management Areas

IIA objective 10: Soils

B.28 Prioritisation of previously developed land over greenfield sites will have a positive effect on conserving and enhancing Thurrock's soil resources. It is assumed that the SHLAA will define whether the site options comprise brownfield or greenfield land. The IIA of site options will reference the findings of this assessment. It is also assumed that prior to development, contaminated sites will be remediated thereby improving soil quality and reducing exposure of the population to health risks from the associated contamination.

B.29 Potential harm to soil quality through the development of greenfield land was assessed by reference to the Agricultural Land Classification (ALC) used by Natural England to give advice to planning authorities and developers. The classification is based on the long-term physical limitations of land for agricultural use. The ALC system classifies land into five grades, with Grade 3 subdivided into subgrades 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a by policy guidance (see Annex 2 of NPPF) however data to subdivide the plan area into grades 3a and 3b is not available for the plan area.

Significance scoring for IIA objective 10 criteria

Each criterion will score:

- Major positive +3
- Negligible 0
- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2
- Significant negative >= -2

Table B.8: IIA draft site assessment criteria for IIA objective 10

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
10a Development of brownfield/contaminated land vs. greenfield land	TBC Site comprising >=50% brownfield/contaminated land	N/A	N/A	N/A	TBC Site comprising >=50% greenfield land	N/A	TBC – SHLAA brownfield vs. greenfield site status Contaminated land Brownfield Land Register
10b Agricultural land	N/A	N/A	All other sites	Significant proportion of site (>=25%) on Grade 3 agricultural land or Site consists partly of Grade 1 and/or 2 agricultural land, but <25% of site	Significant proportion of site (>=25%) on Grade 1 or 2 agricultural land	N/A	Agricultural Land Classifications

IIA objective 11: Resource consumption and waste

B.30 New development is likely to increase consumption of natural resources through construction and by increasing the population, in most cases the location of site options is not expected to have a direct effect on this IIA objective, with effects depending more on the energy efficiency of buildings and the use of good design and construction techniques (including the use of recycled and secondary materials in construction) which will be considered in the IIA of the development management policies. However, development within a Mineral Safeguarding Area may sterilise mineral resources and restrict the availability of resources in the Borough. Furthermore, the location of development on previously developed land protects greenfield land thereby ensuring the prudent and efficient use of natural resources. It is assumed that the SHLAA will define whether the site options comprise brownfield or greenfield land. The IIA of site options will reference the findings of this assessment.

B.31 The location of sites is not likely to influence the volume of waste generated or whether waste will be treated in accordance with the waste hierarchy. These details will be considered in the IIA of the development management policies and site-specific policies.

Significance scoring for IIA objective 11 criteria

Each criterion will score:

- Major positive +3
- Negligible 0

- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2
- Significant negative >= -2

Table B.9: IIA draft site assessment criteria for IIA objective 11

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
11a Minerals safeguarding	N/A	N/A	All other sites	Significant proportion of site (>=25%) is within a Minerals Safeguarding Area	N/A	N/A	Minerals Safeguarding Areas
11b Development of brownfield land vs. greenfield land	TBC Site comprising >=50% brownfield/contaminated land	N/A	N/A	N/A	TBC Site comprising >50% greenfield land	N/A	TBC – SHLAA brownfield vs. greenfield site status Brownfield Land Register

IIA objective 12: Water resources and quality

B.32 Effects of development on water resources will not be appraised on a site-by-site basis; however, support of the Local Plan for water efficient design of new development will be considered in the IIA of development management policies. Effects of development on water quality and quantity will partly depend on the adoption of good practice site layout and construction techniques, as well as the inclusion of sustainable drainage systems (SuDS) and measures to promote the efficient use of water (e.g., reuse of grey and rainwater) in the design of developments. These factors will be considered in the IIA of development management policies. In addition, development could affect surface water quality due to additional discharges of wastewater, for example because there is insufficient treatment capacity at the local wastewater treatment works (WwTWs) or because of nutrient enrichment issues in the receiving waters. These issues are generally managed at the catchment scale and will be considered by the IIA of the spatial strategy and policies on the amount of development to be delivered rather than for individual site options.

B.33 Development could affect water quality in drinking water resources during construction or occupation. Source protection zones (SPZs) are areas designated to protect groundwater sources used for public drinking water supply. They relate to the risk of contamination of the water source from various activities, this increasing as the distance between the source of contamination and the groundwater abstraction point decreases. Drinking Water Safeguard Zones are catchment areas that influence the water quality for associated Drinking Water Protected Areas that are at risk of failing drinking water protection objectives. Site options will be appraised in relation to these zones.

B.34 Sites which are hydrologically connected to waterbodies also present a potential risk of contamination to local water sources. However, it is not possible to assess in the IIA which sites are hydrologically connected and therefore, we

have proposed using a 100m buffer of sites to help identify waterbodies that may be affected by development.

Significance scoring for IIA objective 12 criteria

If any criterion scores major negative or two criteria score minor negative, the overall significance of the effect of the site vs. the IIA objective will be significant negative.

If only one criterion scores minor negative then the overall significance of the effect vs. the IIA objective will be minor negative.

All other sites will have a negligible effect vs. the IIA objective.

Table B.10: IIA draft site assessment criteria for IIA objective 12

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
12a Drinking water quality	N/A	N/A	All other sites	Site falls within a Source Protection Zone 2 or 3 or Site falls within a drinking water safeguard zone (groundwater) or Site falls within a drinking water safeguard zone (surface water)	Site falls within a Source Protection Zone 1	N/A	Environment Agency Source Protection Zones Environment Agency Drinking Water Safeguard Zones
12b Water course	N/A	N/A	All other sites	<=100m from water course	N/A	N/A	Environment Agency waterbodies data

IIA objective 13: Climate change and energy

B.35 IIA objective 13 will be appraised in relation to travel-related carbon emissions through consideration of access to essential services and facilities, public transport, active travel routes, open spaces, and employment sites. The same criteria will be applied and the same IIA scores will be reported as for IIA objectives 4 and 8.

B.36 Other aspects of this IIA objective depend on factors such as the promotion of energy efficient design, water efficient design, and provision and use of renewable energy. These factors do not depend on the location of the site and will be taken into account by the IIA of development management policies and site-specific requirements set out in allocation policies.

IIA objective 14: Flood risk

B.37 Development on greenfield land would increase the area of impermeable surfaces and could therefore increase overall flood risk, particularly where the sites are within high-risk flood zones. The Government's Planning Practice Guidance identifies residential properties as a 'more vulnerable use', which is suitable in areas of Flood Zone 1 and 2 but would require an exception test in flood zone 3a, and is unsuitable in flood zone 3b.

B.38 Surface water flooding occurs when intense rainfall overwhelms drainage systems.

B.39 Groundwater flood risk can occur via permeable superficial deposits (these generally occur in the flood plain, and can be mistaken for fluvial flooding), via high spring flows, and via high bedrock groundwater levels.

B.40 Other aspects of the Local Plan affecting flood risk will be assessed via the IIA of development management policies, for example requirements to incorporate SuDS, the creation and enhancement of green and blue infrastructure, and the allocation and safeguarding of open space for flood storage; or through site-specific policies, for example requirements for flood-resilient design.

Significance scoring for IIA objective 14 criteria

If any criterion scores major negative or two or more criteria score minor negative, the overall significance of the effect of the site vs. the IIA objective will be significant negative.

If only one criterion scores minor negative then the overall significance of the effect vs. the IIA objective will be minor negative.

All other sites will have a negligible effect vs. the IIA objective.

Table B.11: IIA draft site assessment criteria for IIA objective 14

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
14a Flood Risk Zones	N/A	N/A	All other sites	Significant proportion of site (>=25%) within Flood Zone 2	Significant proportion of site (>+25%) within Flood Zone 3a or 3b	Site falls within an area benefitting from flood defences	Environment Agency Flood Risk Zones 2 and 3 (split between Zone 3a and Zone 3b)
14b Surface water flood risk areas	N/A	N/A	All other sites	Significant proportion of site (>+25%) has a 1 in 100 year risk of surface water flooding	Significant proportion of site (>=25%) has a 1 in 30 ear risk of surface water flooding	N/A	Surface water flooding areas (Environment Agency data 'Risk of Flooding from Surface Water (Basic)' identifies areas with a 1 in 100 years or greater risk of surface water flooding)
14c Groundwater flood risk areas	N/A	N/A	TBC	TBC	TBC	TBC	Groundwater flood risk The SFRA is currently being prepared and effects relating to groundwater flood risk will be informed by the outputs of the assessment. Effects will range from negligible to major negative dependent upon the magnitude of risk identified across the Borough.

IIA objective 15: Biodiversity and geodiversity

B.41 Development sites that are close to an internationally, nationally or locally designated conservation site have the potential to affect the biodiversity or geodiversity of those sites/features, e.g., through habitat damage/loss, fragmentation, disturbance to species, air pollution, or increased recreation pressure. Conversely, there may be opportunities to promote habitat connectivity if new developments include green infrastructure. Therefore, while proximity to designated sites provides an indication of the potential for an adverse effect, uncertainty exists as appropriate mitigation may avoid adverse effects and may even result in beneficial effects. In addition, the potential impacts on biodiversity present on each site, or undesignated habitats and species adjacent to the potential development sites, cannot be determined at this strategic level of assessment. This should be determined once more specific proposals are developed and submitted as part of a planning application.

B.42 Impact Risk Zones (IRZs) defined by Natural England will be used to provide an initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. IRZs define zones around each biodiversity site which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. Note that all SACs, SPAs, Ramsar sites and National Nature Reserves (NNRs) are also designated as SSSIs, therefore SSSIs will be used as a proxy for all these designations in the IIA. European sites are underpinned by the SSSI designation and their interest features and sensitivities are covered by the SSSI IRZs. Where the notified features of the European site and SSSI are different, the SSSI IRZs are set so that they reflect both. “Residential” IRZs define unique scales of proposed housing development above which there is a potential for adverse impacts, and this will be taken into account in the appraisal. The effects

of the Local Plan as a whole and of preferred policies and site allocations on European sites will be assessed through the Habitats Regulations Assessment (HRA) of the Local Plan.

B.43 A zone of influence of 250m is assumed for all sub-nationally designated wildlife sites and ancient woodland, based on professional judgement.

B.44 At the level of detail of a Local Plan, it is not possible for effects to be determined with certainty therefore uncertainty is attached to all the effects scores.

Significance scoring for IIA objective 15 criteria

If any of the criteria score major negative then the score will be significant negative.

If two or more criteria score minor negative, then the score will be significant negative.

If only one criterion scores minor negative, then the score is minor negative.

All other sites will have a negligible effect vs. the IIA objective.

Uncertainty will be attached to all scores (?).

Table B.12: IIA draft site assessment criteria for IIA objective 15

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
15a Internationally and nationally designated biodiversity assets	N/A	N/A	All other sites	Intersects with 'residential' or 'all planning applications' IRZ	Intersects with internationally/nationally designated site	All effects are uncertain depending upon whether potential negative effects can be mitigated	International and national wildlife and geological designations covered by the extent of the UK's Sites of Specific Scientific Interest (SSSIs). See Appendix 3 of IRZ Guidance for further guidance
15b Locally designated wildlife sites/corridors and ancient woodland	N/A	N/A	All other sites	<=250m from locally designated site/corridor/ancient woodland	Intersects with locally designated site/corridor/ancient woodland	All effects are uncertain depending upon whether potential negative effects can be mitigated	Local Nature Reserves Local Wildlife Sites Ancient Woodland
15c Priority Habitat Inventory (PHI), local Biodiversity Action Plan (BAP) habitat or protected species	N/A	N/A	All other sites	<=250m from habitat or protected species	Intersects with priority habitat	All effects are uncertain depending upon whether potential negative effects can be mitigated	Local BAP Priority Habitats
15d Geological sites	N/A	N/A	All other sites	<=25% intersects with county/local geological site	>=25% intersects with county/local geological site	All effects are uncertain depending upon whether potential negative effects can be mitigated	County and local geological sites

IIA objective 16: Historic environment

B.45 It is assumed that, as part of its SHELAA, the Council will carry out an assessment of whether or not designated and locally significant heritage assets might be impacted upon by the development of the site options. The IIA of site options will reference the findings of this assessment. The assessment ratings are likely to include the following:

- "Red" – Development of a site would have a significant adverse effect on the historic environment that would be difficult to mitigate.
- "Amber" – Development of a site would have moderate to major impacts, but these could be overcome through sensitive design.
- "Green" – Development of a site is unlikely to affect the historic environment.

B.46 Many other factors within the scope of the Local Plan could affect the achievement of this IIA objective. These will be tested through the IIA of the Local Plan policies, for example in relation to promoting access, enjoyment and understanding of the local historic environment.

Significance scoring for IIA objective 16 criteria

If the criterion scores major negative then the significance of the effect of the site vs. the IIA objective will be uncertain significant negative.

If the criterion scores minor negative then the significance of the effect vs. the IIA objective will be uncertain minor negative.

If the criterion scores negligible then the significance of the effect vs. the IIA objective will be uncertain negligible.

Table B.13: IIA draft site assessment criteria for IIA objective 16

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
16a Heritage impact	Beneficial effects are challenging to register and only in rare circumstances can a new development make a positive contribution to the significance of a heritage asset – for example, by removing harmful elements of its current setting, to better reveal its character and significance. (Typically, it may only improve the visual and experiential qualities of an asset's context – however, this is a townscape and visual rather than an historic environment consideration.)	Beneficial effects are challenging to register and only in rare circumstances can a new development make a positive contribution to the significance of a heritage asset – for example, by removing harmful elements of its current setting, to better reveal its character and significance. (Typically, it may only improve the visual and experiential qualities of an asset's context – however, this is a townscape and visual rather than an historic environment consideration.)	TBC Site rated "green" for risk of effects on heritage assets	TBC Site rated "amber" for risk of effects on heritage assets	TBC Site rated "red" for risk of effects on heritage assets	Where archaeological potential is identified but there is insufficient information to make a judgement on likely levels of significance. Where effects include potential harm to previously unrecognised archaeological assets	TBC – SHLAA high level heritage impact assessment

IIA objective 17: Landscape, townscape and visual impacts

B.47 It is assumed that a landscape sensitivity assessment of sites will be undertaken to inform the SHLAA. This is likely to define the site options as having either “low”, “moderate” or “high” landscape sensitivity. It is assumed that the SHLAA will also define whether the site options comprise brownfield or greenfield land. The IIA of site options will reference the findings of this assessment.

B.48 The redevelopment of derelict, degraded or underused land, particularly within built-up areas, will bring brownfield land back into beneficial use which will positively contribute to the landscape quality of the Borough. Conversely, development of greenfield sites may reduce their positive contribution to character and local distinctiveness, with the development of larger sites expected to have a greater impact on landscape quality and character.

B.49 Other aspects of the Local Plan affecting landscape, townscape and visual impacts will be assessed via the IIA of the Local Plan policies, for example the requirement to use high-quality design principles and to enhance the range and quality of the public realm and open spaces.

Significance scoring for IIA objective 17 criteria

Each criterion will score:

- Major positive +3
- Negligible 0

- Minor negative -1
- Major negative -3

Scores will be totalled and then averaged (i.e. total score divided by number of criteria). Significance of the effect vs. the IIA objective will then be scored as follows:

- Significant positive >= +2
- Minor positive >0 to <2
- Minor negative <0 to <-2
- Significant negative >= -2

Table B.14: IIA draft site assessment criteria for IIA objective 17

Criteria	Major Positive	Minor Positive	Negligible	Minor Negative	Major Negative	Unknown/Uncertain (?)	Datasets
17a Landscape sensitivity	N/A	N/A	TBC Site has “low” overall landscape sensitivity	TBC Site has “medium” overall landscape sensitivity	TBC Site has “high” overall landscape sensitivity	N/A	TBC – SHLAA Landscape Sensitivity Assessment Landscape Character Assessment
17b Development of brownfield land vs. greenfield land	TBC Site comprising >=50% brownfield land within a built-up area	N/A	N/A	N/A	TBC Site comprising >=50% greenfield land outside the built-up area	N/A	TBC – SHLAA brownfield vs. greenfield site status Brownfield Land Register

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410 For example, schools, employment training and lifetime learning facilities, health facilities, recreation areas and services in town/district/local centres

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