



Thurrock Flexible Generation Plant

**Preliminary Environmental Information Report
Chapter 13: Human Health**

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Table of Contents

1. Introduction.....	1
1.1 Purpose of this chapter	1
1.2 Planning policy context	1
1.3 Legislation	2
1.4 Consultation	2
2. Assessment Approach.....	6
2.1 Guidance.....	6
2.2 Assessment Methodology	6
2.3 Baseline study.....	7
2.4 Study area.....	7
2.5 Uncertainties and/or data limitations	9
2.6 Impact assessment criteria	9
2.7 Maximum design envelope parameters for assessment	10
2.8 Impacts scoped out of the assessment.....	10
2.9 Measures adopted as part of Thurrock Flexible Generation Plant	13
3. Baseline environment	14
3.1 Current baseline.....	14
3.2 Future baseline	14
4. Assessment of Effects	16
4.1 Construction phase	16
4.2 Operational and maintenance phase	18
4.3 Decommissioning phase	20
4.4 Transboundary effects	21
4.5 Inter-related effects	21
5. Cumulative Effects Assessment	23
5.1 Introduction	23
5.2 Cumulative effects in ‘max development’ scenario.....	23
5.3 Cumulative effects via environmental health determinants	24
5.4 Cumulative effects via socio-economic health determinants	25
5.5 Cumulative effects from the introduction of residential receptors	27
6. Conclusion and summary	29
6.2 Next Steps.....	29
7. References	31

Table 1.2: Summary of NPS EN-1 policy on decision making relevant to this chapter.....	2
Table 1.3: Key points raised during scoping and consultation to date.....	3
Table 2.1: Potential health determinants summary	6
Table 2.2: Summary of key desktop dataset sources.....	7
Table 2.3: Criteria for magnitude of impact.	9
Table 2.4: Matrix used for the assessment of the significance of an effect.	9
Table 2.5: Maximum design envelope parameters assessed.	11
Table 2.6: Impacts scoped out of the assessment.	11
Table 2.7: Designed-in measures.	13
Table 6.1: Summary of potential environment effects, mitigation and monitoring.	30

List of Figures

Figure 2.1: Social and ecological determinants of health.	6
Figure 2.2: Study Area.	8

Summary

This chapter constitutes the investigation and assessment of potential health determinants pertinent to the construction, operation and decommissioning of the proposed development within the Preliminary Environmental Information Report (PEIR).

Qualifications

This document has been prepared by Tara Barratt, a Health Impact Assessment (HIA) Consultant with an MSc in Environmental Technology and two years’ experience. Tara is an Associate Member of the Institute of Environmental Management and Assessment (IEMA) and contributor to the IEMA Health in EIA Working Group.

It has been reviewed by Dr Andrew Buroni, RPS’ Health and Social Impact Assessment Practice Leader with two decades’ experience. Dr Buroni holds a PhD on international Health and Impact Assessment methods and best practice, a Masters in Environmental Impact Assessment and BSc (Hons) in Biological sciences. He is a Fellow of the Royal Society of Medicine (RSM) and Royal Society for Public Health (RSPH) and sits on the IEMA Health in EIA Working Group.

List of Tables

Table 1.1: Summary of NPS EN-1 provisions relevant to this chapter	1
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1. Introduction

1.1 Purpose of this chapter

- 1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of Environmental Impact Assessment (EIA) work undertaken to date concerning potential impacts of the proposed Thurrock Flexible Generation Plant on human health.
- 1.1.2 The PEIR is being published to inform pre-application consultation. Following consultation, comments on the PEIR will be reviewed and taken into account in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent.
- 1.1.3 Human health can be influenced (both adversely and beneficially) by a number of environmental and socio-economic determinants which can vary on a project by project basis, and are further modified by local community circumstance and existing health burden.
- 1.1.4 It is important to emphasise that the founding principle and purpose of EIA is to investigate potential environmental effects that may pose a risk to the environment and health at a development planning stage. Due to the multidisciplinary nature of health, planning separates health determinants (i.e. activities and hazards with the potential to influence health) into individual technical disciplines and PEIR topic chapters (e.g. air quality, noise, transport).
- 1.1.5 The purpose of the Human Health chapter is to draw from and build upon the key outputs provided within each relevant PEIR topic chapter to further test potential risk to local communities, and where appropriate, to set such risk into context.
- 1.1.6 In particular, this PEIR chapter:
- presents the existing environmental baseline established from desk-based studies, surveys and consultation to date;
 - presents the potential environmental effects on human health arising from the proposed Thurrock Flexible Generation Plant, based on the information gathered and the analysis and assessments undertaken to date;
 - identifies any assumptions and limitations encountered in compiling the environmental information; and

- highlights any necessary monitoring and/or mitigation measures that could prevent, minimise, reduce or offset the possible health effects identified in the EIA process.

1.2 Planning policy context

- 1.2.1 Planning policy for energy generation Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to human health, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1; DECC, 2011a).
- 1.2.2 NPS EN-1 includes guidance on what matters are to be considered in the assessment. These are summarised in Table 1.1 below.

Table 1.1: Summary of NPS EN-1 provisions relevant to this chapter

Summary of NPS EN-1 provision	How and where considered in the PEIR
Human Health	
As described in the relevant sections of this NPS and in the technology-specific NPSs, where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate. The impacts of more than one development may affect people simultaneously, so the applicant and the IPC (nor PINS) should consider the cumulative impact on health (paragraph 4.13.2 of NPS EN-1).	The assessment of human health effects (both adverse and beneficial) for each element of the proposed development (construction, operation and decommissioning) is provided in Section 4. Section 4 also includes mitigation and enhancement measures to help reduce adverse effects and maximise potential benefits for each health determinant within each element of the proposed development. In addition, Section 5.3 assesses potential cumulative impact on health of proposed developments in proximity to the proposed Thurrock Flexible Generation Plant.
The direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests (paragraph 4.13.3 of NPS EN-1).	Potential health determinants pertinent to the proposed development are outlined in Table 2.1. Not all direct health determinants outlined within NPS EN-1 are relevant to the human health assessment for this development. Potential health determinants that have been scoped out of the assessment are outlined in Table 2.6, with the supporting rationale.
New energy infrastructure may also affect the composition, size and proximity of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport or the use of open space for recreation and physical activity (paragraph 4.13.4 of NPS EN-1).	Potential health determinants which are relevant to the proposed development are outlined in Table 2.1. Not all indirect health determinants outlined within NPS EN-1 are relevant to the human health assessment. Potential health determinants that have been scoped out of the assessment are outlined in Table 2.6, with an appropriate justification.

- 1.2.3 NPS EN-1 also highlights one factor relating to the determination of an application and in relation to mitigation. These are summarised in Table 1.2 below.

Table 1.2: Summary of NPS EN-1 policy on decision making relevant to this chapter

Summary of NPS EN-1 policy on decision making (and mitigation)	How and where considered in the PEIR
Human Health	
Generally, those aspects of energy infrastructure which are most likely to have a significantly detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either constitute a reason to refuse consents or require specific mitigation under the Planning Act 2008. However, the IPC will want to take account of health concerns when setting requirements relating to a range of impacts such as noise (paragraph 4.13.5 of NPS EN-1).	The potential human health effects from exposure to noise will be taken into consideration applying the WHO guidelines for Community Noise and the WHO guidelines for Europe.

- 1.2.4 Promoting healthy and safe communities is a theme of the National Planning Policy framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2018), which states that *“Planning policies and decisions should aim to achieve healthy, inclusive and safe places which: a) promote social interaction [...], b) are safe and accessible [...], and c) enable and support healthy lifestyles [...].”* (paragraph 91).
- 1.2.5 Policy PMD1 in the Thurrock Council Core Strategy and Policies for Management of Development (as amended) Adopted January 2015, refers to Minimising Pollution and Impacts on Amenity, Health, Safety and the Natural Environment, whereby:
- 1.2.6 *“1. Development will not be permitted where it would cause or is likely to cause unacceptable effects on:*
- i. the amenities of the area;*
 - ii. the amenity, health or safety of others;*
 - iii. the amenity, health or safety of future occupiers of the site; or*
 - iv. the natural environment.*
- 2. Particular consideration will be given to the location of sensitive land uses, especially housing, schools and health facilities”.*

1.3 Legislation

- 1.3.1 Paragraph 5(2)(a) and Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require that an EIA assesses the effects (where likely to be significant) on population and human health, among other factors.

1.4 Consultation

- 1.4.1 Key issues raised during scoping and consultation to date specific to human health are listed in Table 1.3, together with how details of these issues have been considered in the production of this PEIR, and cross-references to where and how all of the concerns raised are assessed through the planning process.

Table 1.3: Key points raised during scoping and consultation to date

Date	Consultee and type of response	Points raised	How and where addressed
September 2018	PINS	The Inspectorate notes that impacts to human health from air quality are to be considered and advises that this includes consideration of impacts from construction dust.	The air quality section considers local baseline and assesses to objective thresholds set to be protective of health. The Code of Construction Practice (CoCP) addresses any residual environmental and health hazard. The Human Health chapter draws from and builds upon the air quality assessment, to further investigate any potential impact to local community health during construction, operation and decommissioning.
September 2018	PINS	The Inspectorate notes that the underground cable will exceed 132kV (as referenced in the Department for Energy and Climate Change (DECC) voluntary Code of Practice (DECC, 2012). The Applicant must provide sufficient evidence to demonstrate compliance with the International Commission on Non-Ionising Radiation Protection (ICNIRP) restrictions, in accordance with the DECC voluntary Code of Practice. If significant effects associated with increased electro-magnetic field (EMF) are likely, this should be assessed in the ES.	The underground cable will be designed to comply with the relevant guideline exposure limits set out in the DECC Code of Practice (DECC, 2012) and that compliance evidence would be provided in due course following detailed design of the electrical infrastructure. On this basis, potential changes in EMF will be compliant with guidance set to be protective of both occupational and public health.
September 2018	PINS	The assessment of impacts to human health should consider all phases of the proposed development, alone and cumulatively with other developments.	All of the PIER topics, including the Human Health chapter considers construction, operation and decommissioning phases of the proposed development, and further considers potential cumulative impacts.
September 2018	PINS	Specific sensitive receptors for the purposes of the human health assessment have not been proposed in the Scoping Report. The ES should identify the locations of the sensitive receptors (and their distances from the proposed development) and explain how these have been selected, with reference to the extent of the likely impacts. Consideration should be given to people living in residential premises, people at work/ school/ in healthcare facilities, people using recreational areas/ transport infrastructure routes/ publicly accessible land, waterbodies and any drinking water supplies.	From a human health perspective, receptor sensitivity is partly defined by the individual hazard characteristics and exposure pathways (where the physical hazard characteristics, exposure pathways, and aetiology varies between health determinants). Effective scoping is therefore the means to firstly identify the potential hazards, define their hazard characteristics, informing both the evidence base selected, and the health and health care baseline data required. In this instance, a proportionate assessment has been defined through scoping, and relative sensitivity has been considered through the baseline data collated, which is tailored to the specific hazards and exposure pathways pertinent to what is proposed. For clarity, Human Health sensitive receptors remain consistent with the respective topic chapters which overlap with the human health assessment. As such, it is not necessary to carry out a discrete sensitive receptor identification exercise for the purpose of the human health assessment.
6th September 2018	Essex County Council	It is strongly recommended that a health impact assessment is prepared as part of this proposal. The wider determinants of health, with reference to any potential socio-economic benefits, should be explored i.e. employment opportunities including during the construction phase of this project.	All matters that would have been covered within a standalone health impact assessment (HIA) have been integrated within the regulatory assessment process and addressed within the Human Health chapter. As such, a standalone health impact assessment is not deemed necessary. The wider determinants of health (such as income and employment generation) have been duly considered and are included as a sub-section within the human health assessment.
No Date	Tilbury2	The potential prolonged construction period (even though significant construction at Tilbury2 will be completed prior to commencement at Thurrock Flexible Generation Plant, Lower Thames Crossing or Tilbury Energy Centre) could have both physical and psychological health impacts on local communities. The cumulative impact of all four projects once operational on health would need to be considered further once more detail on aspects such as air quality and noise are known.	Cumulative impacts on human health have been considered within Section 5 of the Human Health chapter.

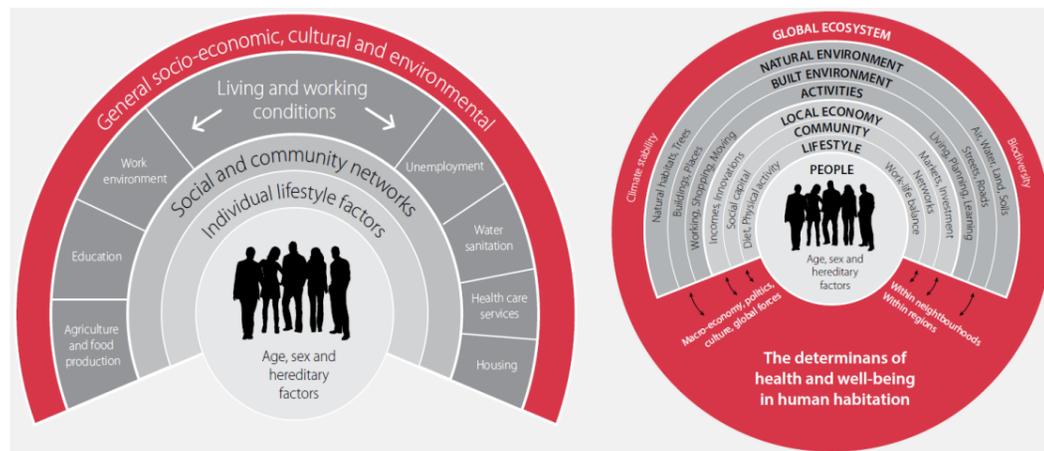
Date	Consultee and type of response	Points raised	How and where addressed
6th September 2018	Public Health England (PHE)	<p>PHE state that a specific human health section should be provided which summarises key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health. In addition, PHE state that compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.</p> <p>PHE include an appendix which outlines the generic areas that should be addressed by all promoters when preparing ES for inclusion with an NSIP submission.</p>	<p>This chapter constitutes a specific human health section, the structure of which follows a defined structure which meets EIA requirements and references relevant requirements of National Policy Statements and relevant guidance.</p> <p>In addition, the appendix of the scoping opinion provided by PHE outlining the generic areas that should be addressed are taken into account where relevant.</p>
3rd September 2018	Thurrock Borough Council	<p>“It is important that consideration is paid to the potential human health impacts in respect of this proposed development. This relates to the health and wellbeing of any person(s) employed both during construction and operational stages, local residents living in communities within close proximity to the proposed development and the wider community as a whole where impacts may be felt.”</p>	<p>The health and wellbeing of any person employed during the construction and operation phase is inherently addressed by the Health and Safety at Work etc. Act 1974. On this basis, assessing this would go beyond the scope and focus of the EIA. Therefore, it is not considered appropriate or necessary to include any detail on this matter within the Human Health chapter.</p> <p>The Human Health chapter does however assess the potential human health impacts of local residents and the wider community.</p>
3rd September 2018	Thurrock Borough Council	<p>The following health determinants are acknowledged by Thurrock Borough Council as requiring further investigation within the human health chapter:</p> <ul style="list-style-type: none"> • Air quality • Traffic • Noise • Water safety 	<p>The Human Health chapter investigates the potential impact on human health from a number of health determinants that include air quality, traffic and noise. The potential human health impacts resulting from water safety has been scoped out of the human health assessment on the basis that the accidental spillage of polluting materials are to be assessed within Volume 3, Chapter 15: Hydrology and Flood Risk and Chapter 16: Geology, Hydrology and Ground Conditions to environmental standards set to be protective of health.</p>
3rd September 2018	Thurrock Borough Council	<p>“We would request that due to the ‘likely significant impacts’ and the cumulative effects of this and other significant infrastructure to be developed in close proximity to this site that a standalone HIA chapter will provide a comprehensive and detailed account of all potential impacts, their likelihood and significance in terms of impact on human health and welcome your confirmation on this. As part of the HIA consideration of the cumulative impacts as this and other developments will be needed to ensure that health impacts are accurately measured and mitigation is sufficient and appropriate.”</p>	<p>All matters that would have been covered within a standalone HIA are assessed and addressed within the Human Health chapter (including cumulative impacts). As such, a HIA is not deemed necessary, where the process is fully integrated within the regulatory planning process, affording the same weight upon planning and decision making as the other technical disciplines (as opposed to remaining separate from the regulatory planning process).</p>
3rd September 2018	Thurrock Borough Council	<p>“A HIA chapter would include ward(s) level health profiles of the local area/communities whose health may be impacted by the development. This ward level information is available from PHE’s “Local Health” website which is available at: http://www.localhealth.org.uk/#!-en:v=map13.</p> <p>Further borough level information is available at Public Health England’s Health Profile tool, ‘Fingertips’ which is available at: https://fingertips.phe.org.uk/. A health profile would enable consideration to be paid to the possible health impacts of the specific population living within Tilbury, and mitigation could be embedded that would help reduce the health inequalities faced by this population. Tilbury is one of the most deprived wards within Thurrock, with the most health needs. This should be fully accounted for in any conclusions drawn in this health assessment.”</p>	<p>Baseline data has been collected at the local authority level rather than ward level on the basis that this data is more readily available, recent and has a larger variety of statistics to draw upon pertinent to the health pathways directly attributable to what is proposed. As a result, it is considered that local authority level data is more representative when compared to ward level data, and allows the assessment to consider public health trends, priorities and needs.</p> <p>The human health baseline draws from available statistics detailed within Public Health England’s “Local Health” website and Public Health England’s Health Profile tool, ‘Fingertips’.</p> <p>The human health baseline acknowledges the deprivation levels within Thurrock and health needs of the communities living in the vicinity of the proposed development.</p>
3rd September 2018	Thurrock Borough Council	<p>“We would like to understand more fully how engagement and consultation with the community will feed into the health assessment and the health outcome conclusions made within this report.”</p>	<p>All points raised relating to human health during consultation will be reviewed and taken into consideration when refining and finalising the scope and focus of the human health assessment. Where a suggestion regarding the scope of the human health assessment is made but is not considered appropriate to include, a justification will be provided as to why.</p> <p>Justification for the scoping out of particular health determinants is also included within Table 2.6.</p>

Date	Consultee and type of response	Points raised	How and where addressed
3rd September 2018	Thurrock Borough Council	<p><i>“We would also like, as part of the socio-economic and amenity element, to touch on the Landscape and visual effects LVIA that is to be undertaken and suggest that consideration be paid to the potentially negative effects to emotional wellbeing and potential decrease in civic pride that could be felt by Thurrock residents through bad visual planning, as well as potential economic effects on the locality by the negativity of visitors from outside the borough to the historical sites and SSI areas.”</i></p>	<p>Volume 3, Chapter 7: Landscape and Visual Resources considers potential changes in vista and the impact significance therein.</p>
8th August 2018	Thurrock Borough Council	<p>Thurrock Borough Council note the relatively high deprivation levels and vulnerability of some local communities to health impacts and high respiratory disease baseline rates (including Chronic Obtrusive Pulmonary Disorder (COPD)).</p>	<p>The human health baseline includes statistics on respiratory disease emergency hospital admissions and mortality rates and acknowledges that this is higher than the national average. COPD is specifically considered within baseline emergency hospital rate statistics for chronic lower respiratory diseases (which is calculated using raw admissions statistics for England and the local Thurrock COPD Standardised Admissions Ratio).</p>

2. Assessment Approach

2.1 Guidance

- 2.1.1 'Health' is commonly defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (the definition used by the World Health Organisation, WHO, since 1948) (WHO, 1948).
- 2.1.2 There is a large body of guidance on health assessment generally and in the context of development planning, drawing from expert evidence and national government policy regarding the importance of integrating public health into the planning system.
- 2.1.3 The basis of this assessment is to apply a broad socio-economic model of health that encompasses conventional health impacts such as disease, accidents and risk, along with wider health determinants vital to achieving good health and wellbeing such as employment and local amenity. It considers both physical and mental health, and also addresses equality and social impacts where possible. The assessment is therefore based on both 'social' and 'ecological' (environmental) determinants of health, illustrated in Figure 2.1, which are affected through relevant health pathways defined.



Reproduced from Chadderton et al. (2012), citing Dahlgren and Whitehead (1991), and Barton and Grant (2006).

Figure 2.1: Social and ecological determinants of health.

- 2.1.4 When defining potential health determinants for a development project, it is also useful to consider three broad domains of public health practice:
- health protection (i.e. environmental pollution and standards set to protect health);

- health promotion (i.e. healthy lifestyles, socio-economic status and inequalities); and
- health care (i.e. provision, effectiveness and equity of access to healthcare services).

2.2 Assessment Methodology

- 2.2.1 The assessment follows a source-pathway-receptor approach to identify and assess health impacts that are plausible, and directly attributable to the proposed development. A hazard source itself is not necessarily a health risk: it is only when there is a hazard source, a sensitive receptor and a pathway of exposure where there is any potential for risk to health. Where a source-pathway-receptor linkage exists, then the nature of the specific hazard source, the magnitude of impact via the pathway and the sensitivity of the receptor determine what level of health risk is predicted.
- 2.2.2 The potentially relevant health and wellbeing pathways that have been assessed are identified in Table 2.1. These pathways have been identified through analysis of the proposed development's construction and operational activities as defined in Volume 2, Chapter 2: Project Description, and have been reinforced through scoping feedback with statutory consultees (Table 1.3).
- 2.2.3 Identification of a potentially relevant health pathway at this stage does not necessarily indicate that there would be a significant impact through that pathway. A significant impact would depend on the magnitude of change, the sensitivity of receptors and the degree to which they are affected.

Table 2.1: Potential health determinants summary

Potential health determinant	Potential for impact	Impact type
Construction		
Exposure to air pollution (including nuisance dust, PM ₁₀ , PM _{2.5} and NO ₂)	Adverse	Temporary, direct, local
Changes in noise exposure	Adverse	Temporary, direct, local
Construction traffic (safety, amenity, severance)	Adverse	Temporary, direct, local and regional
Construction income and employment opportunities	Beneficial	Temporary, direct, indirect and induced, local and regional

Potential health determinant	Potential for impact	Impact type
Operation		
Exposure to air pollution (including PM ₁₀ , PM _{2.5} and NO ₂)	Adverse	Permanent, direct, local
Changes in noise exposure	Adverse	Permanent, direct, local
Construction traffic (safety, amenity, severance)	Adverse	Permanent, direct, local and regional
Operation income and employment opportunities	Beneficial	Permanent, direct, indirect and induced, local
Decommissioning		
Exposure to air pollution (including nuisance dust PM ₁₀ , PM _{2.5} and NO ₂)	Adverse	Temporary, direct, local
Changes in noise exposure	Adverse	Temporary, direct, local
Decommissioning traffic (safety, amenity, severance)	Adverse	Temporary, direct, local and regional
Decommissioning income and employment opportunities	Beneficial	Temporary, direct, indirect and induced, local and regional

2.3 Baseline study

Desktop study

2.3.1 Information on human health within Thurrock Borough Council, Essex county, East of England region and England were collected through a detailed desktop review of existing datasets. These are summarised at Table 2.2 below.

Table 2.2: Summary of key desktop dataset sources

Title	Source	Year
Life Expectancy	PHE Health Profiles	2010-2016
Healthy Life Expectancy	Office for National Statistics (ONS)	2009-2014
Mortality Statistics	PHE Health Profiles	2009-2016
Mental Health Statistics	PHE Mental Health and Wellbeing JSNA	2010-2017
Lifestyle Statistics	PHE Health Profiles	2012-2017
Hospital Admissions	HSCIC	2015-2016
The English Indices of Deprivation	Department for Communities and Local Government	2015

Title	Source	Year
Socio-economic Statistics	NOMIS	2012-2017

2.4 Study area

2.4.1 The geographical study area for environmental health determinants within the human health assessment is confined to Thurrock Borough Council (Figure 2.2) as it is anticipated that impacts from environmental health determinants would remain local. In addition, district level is the lowest geographical level that the most up to date baseline statistics are available for.

2.4.2 The study area for socio-economic health determinants is also confined to Thurrock Borough Council. While it is likely that socio-economic determinants (i.e. income and employment) associated with the proposed development have a wider sphere of influence (as employment could potentially be sourced from further afield), it is still considered that Thurrock Borough Council is an appropriate study area on the basis that the majority of employment opportunities would be sourced within Thurrock Borough Council.

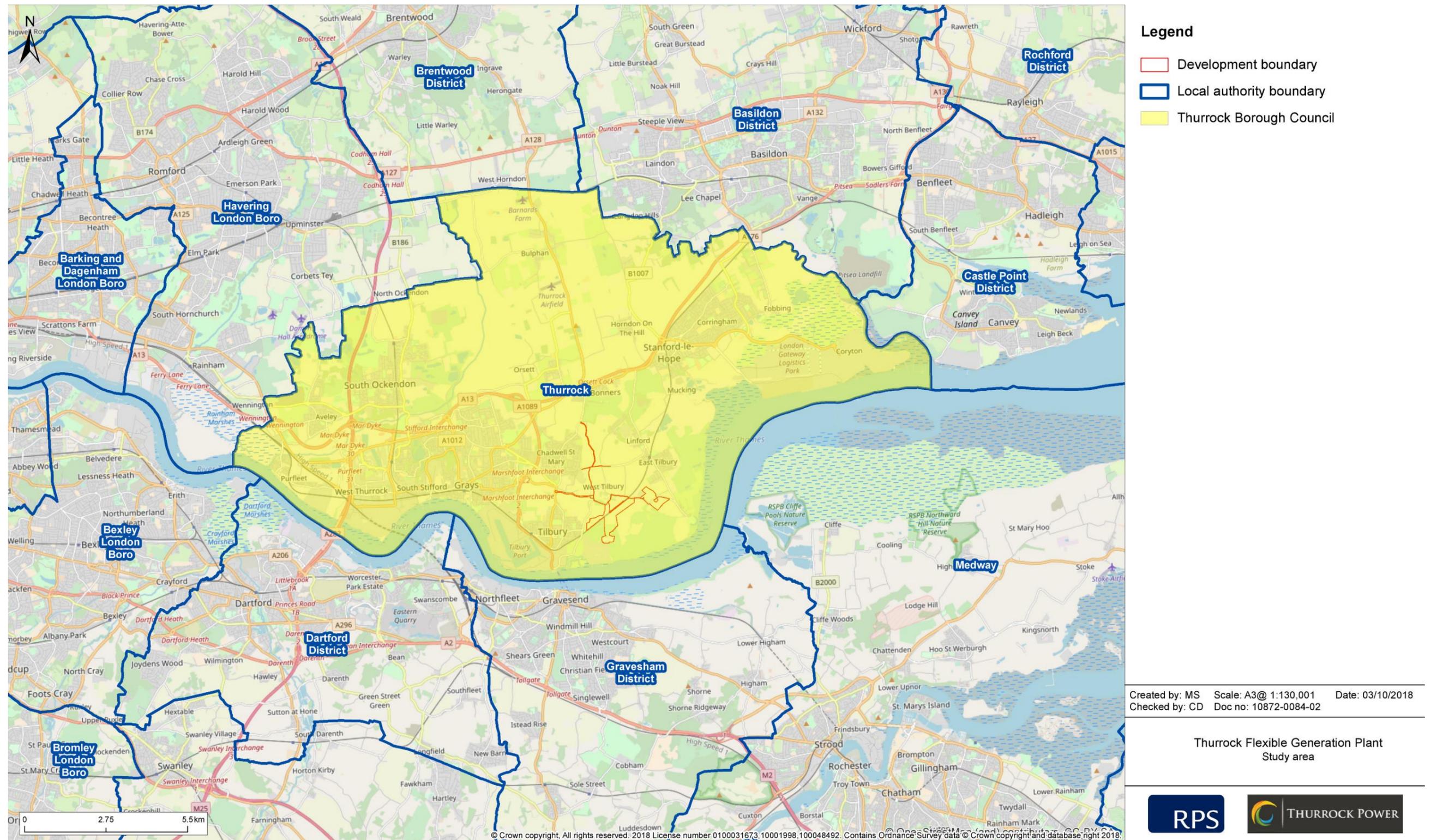


Figure 2.2: Study Area.

2.5 Uncertainties and/or data limitations

- 2.5.1 The human health assessment draws from and builds upon the technical outputs from the PIER (most notably the air quality, noise and vibration, transport and socio-economic assessment chapters), to investigate changes in environmental and socio-economic conditions directly attributable to the proposed development. As a consequence the limitations of the supporting assessments, and the conservative assumptions applied to address them, are inherent to the assessment of health.
- 2.5.2 Baseline data limitations are managed through the triangulation of national statistics to establish local health circumstance and relative sensitivity to the individual health pathways assessed.
- 2.5.3 It is considered that the information available provides a suitable basis for a robust assessment of human health for EIA purposes.

2.6 Impact assessment criteria

- 2.6.1 The significance of an effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact of that magnitude. This section describes the criteria applied in this chapter to characterise the magnitude of potential impacts and sensitivity of receptors. The terms used to define magnitude and sensitivity are based on those used in the Design Manual for Roads and Bridges (DMRB) methodology, which is described in further detail in Volume 2, Chapter 4: Environmental Impact Assessment Methodology.
- 2.6.2 The criteria for defining magnitude in this chapter is informed through the assessment process, tailored to the individual health pathways, hazard characteristics and end health points to inform a professional judgement on magnitude outlined in Table 2.3.

Table 2.3: Criteria for magnitude of impact.

Magnitude of impact	Definition used in this chapter
Major	Change in environmental and socio-economic circumstance sufficient to result in a major change in baseline population health (adverse or beneficial)
Moderate	Change in environmental and socio-economic circumstance sufficient to result in a moderate change in baseline population health (adverse or beneficial)
Minor	Change in environmental and socio-economic circumstance sufficient to result in a minor change in baseline population health (adverse or beneficial)
Negligible	Change in environmental and socio-economic circumstance below that for which it is possible to result in any manifest health outcome at a population level (adverse or beneficial)

Magnitude of impact	Definition used in this chapter
No change	No opportunity for change in health outcome

- 2.6.3 Within a defined population, existing burdens of health and sensitivity to changes in environmental and socio-economic conditions can vary significantly due to individual socio-economic circumstance, genetic predisposition and even stage of life.
- 2.6.4 On this basis, a precautionary approach has been applied by assuming that the entire population of Thurrock are of a uniformly **high** sensitivity to changes in environmental (air quality, noise etc) and socio-economic conditions.
- 2.6.5 The significance of the effect upon human health is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 2.4. Where a range of significance of effect is presented in Table 2.4, the final assessment for each effect is based upon expert judgement.
- 2.6.6 For the purpose of this assessment, any effects with a significance level of minor or less are considered to be **not significant** in EIA terms.

Table 2.4: Matrix used for the assessment of the significance of an effect.

	Magnitude of impact					
		<i>No change</i>	<i>Negligible</i>	<i>Minor</i>	<i>Moderate</i>	<i>Major</i>
Sensitivity of receptor	<i>Negligible</i>	No change	Negligible	Negligible or minor	Negligible or minor	Minor
	<i>Low</i>	No change	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	<i>Medium</i>	No change	Negligible or minor	Minor	Moderate	Moderate or major
	<i>High</i>	No change	Minor	Minor or moderate	Moderate or major	Major or substantial
	<i>Very high</i>	No change	Minor	Moderate or major	Major or substantial	Substantial

2.7 Maximum design envelope parameters for assessment

- 2.7.1 The maximum design envelope parameters identified in Table 2.5 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These parameters have been identified based on the overview description of the development provided in Volume 2, Chapter 2: Project Description, including all potential development options where these are under consideration by the applicant.
- 2.7.2 Effects of greater adverse significance are not predicted to arise should any other development scenario within the project design envelope be taken forward in the final design scheme.

2.8 Impacts scoped out of the assessment

- 2.8.1 The impacts listed in Table 2.6 have been scoped out of the assessment for human health as agreed through the EIA scoping process detailed in Volume 2, Chapter 5: Scoping and Consultation.

Table 2.5: Maximum design envelope parameters assessed.

Potential impact	Maximum design scenario	Justification
Construction		
Health and wellbeing impact due to direct, indirect and induced employment generation associated with the construction phase	Construction workforce averaging 80 full-time equivalent (FTE) and peaking at 120 FTE for up to 18 months	Reasonable employment generation predicted by the applicant, which would have potential for beneficial effects on health and wellbeing
Health and wellbeing impact due to changes in construction traffic (potentially affecting severance, risk of accident and injury and pedestrian or cyclist amenity)	Maximum design scenario for construction traffic generation as specified in Volume 3, Chapter 10: Traffic and Transport	The maximum design scenario parameters for construction traffic generation have been specified for that assessment
Health and wellbeing impact due to changes in noise exposure (potentially affecting annoyance, stress or sleep disturbance)	Maximum design scenario for construction noise generation as specified in Volume 3, Chapter 11: Noise and Vibration	The maximum design scenario parameters for construction noise and vibration have been specified for that assessment
Health and wellbeing impact due to changes in air quality (potentially affecting respiratory health or mortality)	Construction dust risk and construction traffic air pollutant impact maximum design scenario as specified in Volume 3, Chapter 12: Air Quality	The maximum design scenario parameters for air pollutant emissions have been specified for that assessment
Operation and maintenance		
Health and wellbeing impact due to direct, indirect and induced employment generation associated with the operation phase	Up to four FTE operational employees (off-site) Maintenance employment generation of up to two FTE	Reasonable employment generation predicted by the applicant, which would have potential for beneficial effects on health and wellbeing
Health and wellbeing impact due to changes in operational and maintenance traffic (potentially affecting severance, risk of accident and injury and pedestrian or cyclist amenity)	Maximum design scenario for traffic generation as specified in Volume 3, Chapter 10: Traffic and Transport	The maximum design scenario parameters for operational and maintenance traffic generation have been specified for that assessment
Health and wellbeing impact due to changes in noise exposure (potentially affecting annoyance, stress or sleep disturbance)	Maximum design scenario for operational and maintenance noise generation as specified in Volume 3, Chapter 11: Noise and Vibration	The maximum design scenario parameters for operational and maintenance noise generation have been specified for that assessment
Health and wellbeing impact due to changes in air quality (potentially affecting respiratory health or mortality)	Gas engines' air pollutant impact maximum design scenario as specified in Volume 3, Chapter 12: Air Quality	The maximum design scenario parameters for gas engines' air pollutant emissions have been specified for that assessment
Decommissioning		
Human health impacts from operational sources listed above	Ongoing operation of all or part of flexible generation plant after 35 years	Greatest long-term impact
Human health impacts from decommissioning and deconstruction activity	Decommissioning and deconstruction workforce similar to the construction phase	Reasonable maximum employment generation predicted by the applicant

Table 2.6: Impacts scoped out of the assessment.

Potential impact	Justification
Construction phase	
Water pollution	The potential pollution of surface watercourses/controlled waters within or near the proposed development area during construction due to the accidental spillage of polluting materials are to be assessed within Volume 3, Chapter 15: Hydrology and Flood Risk and Volume 3, Chapter 16: Geology, Hydrology and Ground Conditions to environmental standards set to be protective of health.

Potential impact	Justification
Composition, size and proximity of local population	Construction will be temporary and it is likely that the majority of construction workers would commute from their existing place of residence; on this basis, it is anticipated that there would be no long-term introduction of a workforce to the area. As a result, there would be no change to the composition, size or proximity of the local population.
Access to key public services, transport or use of open space for recreation and physical activity	The application site primarily comprises agricultural land; as a result, there is no scope for adverse impacts to human health resulting from reduced access to key public services, transport or use of open space for recreation and physical activity during construction.
Operation and maintenance	
Water pollution	There is no hazard source as the proposed development will not generate waste water (aside from potentially cooling water) or process effluent during normal operation. Any surface run off entering the existing watercourse would be clean. The facility will also be operated in accordance with an Environmental Permit and will have a managed surface drainage system with oil interceptors, bunding and spill kits in case of accidents. In addition, the potential pollution of surface watercourses/controlled waters within or near the proposed development area during operation due to the accidental spillage of polluting materials are to be assessed within Volume 3, Chapter 15: Hydrology and Flood Risk and Volume 3, Chapter 16: Geology, Hydrology and Ground Conditions to environmental standards set to be protective of health.
Odour	The main pollutant from the exhaust stacks is nitrogen oxides which are not associated with any odour impacts.
Visual impacts	Visual impacts are addressed within a dedicated chapter (Volume 3, Chapter 6: Landscape and Visual Resources).
Hazardous waste and substances	The proposed development is not expected to be a Control of Major Accident Hazards (COMAH) site. As a result, there is no scope to include any assessment relating to potential health impacts resulting from exposure to hazardous waste and substances.
Radiation	The operational activities associated with the proposed development would not generate any ionising radiation. While the proposed development would be a source of non-ionising power-frequency electric and magnetic fields, given the location of the development immediately adjacent to the existing Tilbury Substation with minimal distance for the grid connection, there is no potential for public exposure to EMF generated, and all generation and transmission infrastructure will comply with ICNIRP set to be protective of both public and occupational health.
Increases in pests	An increase in pests would generally be associated with the uncontrolled storage of waste, this is not the case for the proposed development, where all materials are enclosed within secure areas, and managed accordingly. As such, the operational activities associated with the proposed development would not increase the presence of pests within the local area.
Composition, size and proximity of local population	The proposed development will have no influence on the size or proximity of local populations.
Access to key public services, transport or use of open space for recreation and physical activity	The application site primarily comprises agricultural land; as a result, there is no scope for adverse impacts to human health resulting from reduced access to key public services, transport or use of open space for recreation and physical activity during operation.
Decommissioning phase	
Water pollution	The potential pollution of surface watercourses/controlled waters within or near the proposed development area during decommissioning due to the accidental spillage of polluting materials are to be assessed within Volume 3, Chapter 15: Hydrology and Flood Risk and Volume 3, Chapter 16: Geology, Hydrology and Ground Conditions to environmental standards set to be protective of health.
Composition, size and proximity of local population	Decommissioning will be comparable to the construction phase, and will have no influence on the size or proximity of local populations.
Access to key public services, transport or use of open space for recreation and physical activity	The application site primarily comprises agricultural land; as a result, there is no scope for adverse impacts to human health resulting from reduced access to key public services, transport or use of open space for recreation and physical activity during decommissioning.

2.9 Measures adopted as part of Thurrock Flexible Generation Plant

2.9.1 A number of measures have been designed in to the flexible generation plant to reduce the potential for impacts on human health. These are listed in Table 2.7.

Table 2.7: Designed-in measures.

Measures adopted as part of Thurrock Flexible Generation Plant	Justification
Any common land or access to land which is lost as a result of the proposed development would be replaced to ensure that there are no adverse impacts.	Removes potential adverse impact on health and wellbeing by creating barriers to recreation and participation in physical activity.
<p>All designed-in measures outlined within the wider technical disciplines relevant to human health which comprise:</p> <ul style="list-style-type: none"> • Volume 3, Chapter 8: Land Use, Agriculture and Socio-Economics • Volume 3, Chapter 10: Traffic and Transport • Volume 3, Chapter 11: Noise and Vibration • Volume 3, Chapter 12: Air Quality 	The environmental and socio-economic determinants listed have the potential to directly and indirectly influence health, these wider technical disciplines also offer relevant designed-in mitigation for the protection of human health.
<p>All underground cabling associated with the proposed development would not be in a publicly accessible location.</p> <p>Evidence of compliance with guideline occupational exposure limits for electromagnetic fields is to be provided following detailed design of the electrical infrastructure.</p>	Electric and magnetic fields associated with the generation and transmission are addressed through appropriate design to manage exposure at source to prevent exposure sufficient to result in occupational or public health risk.

3. Baseline environment

3.1 Current baseline

3.1.1 Evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of social and demographic structure, behaviour and relative economic circumstance; the aim of this section is to summarise local health circumstance, and underlying factors pertinent to the assessment and mitigation therein.

3.1.2 For a full account of the supporting information and source referencing refer to Volume 6, Appendix 13.1: Health Baseline.

Life expectancy and physical health

3.1.3 Both male and female life expectancy within Thurrock are below the regional and national averages. In general, female healthy life expectancy is also below the regional and national averages; male healthy life expectancy on the other hand has been improving over the years, and is now above the regional and national average.

3.1.4 Emergency hospital admissions for a variety of respiratory and cardiovascular diseases and conditions are higher in Thurrock compared to the national average. Generally, all-age all-cause mortality and all specific causes of mortality analysed (cancer, respiratory disease, cardiovascular disease) are all higher than their comparators.

Mental health

3.1.5 Mental health statistics within Thurrock are mixed. Dementia recorded incidence and hospital stays for self-harm are below the regional and national average. Conversely, suicide rate has been increasing within Thurrock to above the regional and national average, while depression recorded incidence has remained relatively static and is higher than the regional average but lower than the national average.

Lifestyle

3.1.6 The proportion of obese children and excess weight in adults is higher than the regional and national averages and is increasing. Mirroring this, the proportion of adults meeting the recommended weekly duration of physical activity is below the regional and national averages.

3.1.7 Risk taking behaviours include smoking and excessive alcohol intake. Smoking prevalence is higher than the regional and national averages, while hospital stays for alcohol related harm are below the regional and national average.

Deprivation

3.1.8 Overall, there is a larger proportion of Lower Super Output Areas (LSOA) within Thurrock categorised in the 20% most deprived nationally compared to the 20% least deprived nationally. When analysing domains against each other, the education and crime domains are the most deprived within Thurrock, while the health domain is the least deprived within Thurrock.

Socio-economic

3.1.9 Employment and unemployment figures within Thurrock are relatively similar to the county, regional and national averages. However, income levels remain consistently below the county, regional and national averages. Qualification attainment within Thurrock is also below the national average.

Conclusion

3.1.10 On the above basis, and as detailed in Volume 6, Appendix 13.1: Health Baseline, population health throughout Thurrock is generally below the national and regional trend. While such circumstance is improving for some indicators, it is not uniform, with high burdens of poor health linked to areas of socio-economic deprivation.

3.1.11 The underlying aetiology is complex, influenced by a multitude of risk factors, including lifestyle, socio-economic circumstance and may be compounded by environmental factors. While at risk of generalising, the health assessment has applied a precautionary approach, and consider that the entire population of Thurrock are of a uniformly high sensitivity to changes in environmental (air quality noise etc) and socio-economic conditions.

3.2 Future baseline

3.2.1 As it is challenging to predict the future human health baseline with high confidence, trends are analysed as part of the current baseline to provide insight into likely future local community circumstance. For the purpose of this assessment, the present-day baseline human health data have been used.

Climate change

- 3.2.2 The Met Office UK Carbon Projections ('UKCP09') dataset¹ provides probabilistic projections of change in climatic parameters over time for 25 km grid squares across the UK. Projected changes during low, medium and high future global greenhouse gas emissions scenarios have been reviewed for the period from 2020 up to 2069, encompassing the potential six year construction and 35 year operational periods of the proposed development.
- 3.2.3 The likely ranges of change in climatic parameters including precipitation, temperature, wind speed, humidity and frequency of extreme weather are not considered to materially affect the future baseline described above for human health or increase the sensitivity of receptors to impacts beyond that described in Section 3.2.1.

¹ CP09 is presently being updated to CP18, expected to be published in November 2018 (Met Office, 2018). CP09 remains the most up-to-date available data and remains an appropriate tool for adaptation planning (Met Office, 2017).

4. Assessment of Effects

4.1 Construction phase

Human health effects from changes to air quality

Magnitude of impact

4.1.1 During construction, potential human health effects from changes to air quality would be limited to increased annoyance from nuisance dust. Prior to mitigation, this would be a direct and local impact resulting from on-site construction activities and through track out from associated transport movements. Due to the nature of the construction period, the impact would be short term and intermittent.

4.1.2 Volume 3, Chapter 12: Air Quality assesses the magnitude of impact at human receptors. The human health effects from changes to air quality are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but not of a concentration or exposure sufficient to quantify any change in baseline health. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

4.1.3 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been taken, where the sensitivity of residential receptors to human health effects from changes to air quality is considered to be uniformly **high**.

Significance of effect

4.1.4 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.5 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.6 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes in noise exposure

Magnitude of impact

4.1.7 Construction activities would take place during day time hours only. As such, potential human health effects from changes in noise exposure would be limited to increased annoyance from a reduction in local amenity. This would be a direct and local impact resulting from on-site construction activities and associated transport movements. Due to the nature of the construction period, the impact would be short term and intermittent.

4.1.8 Volume 3, Chapter 11: Noise and Vibration assesses the magnitude of impact at human receptors. The human health effects from changes in noise exposure are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but is not of a magnitude, exposure, duration or timing to quantify any change in baseline health. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

4.1.9 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been taken, where the sensitivity of residential receptors to human health effects from changes in noise exposure is considered to be uniformly **high**.

Significance of effect

4.1.10 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

4.1.11 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.1.12 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes to transport nature and flow rate

Magnitude of impact

- 4.1.13 An increase in HGVs and staff vehicle movements has the potential to change the transport nature and flow rate. Depending on the magnitude of change, there is the potential for an increased risk of accident and injury; feelings of isolation from increased severance; and loss of amenity from increased severance or transport disruption. Any change to transport nature and flow rate would be a direct and local impact; due to the nature of the construction period, the impact would be short term and intermittent.
- 4.1.14 Volume 3, Chapter 10: Traffic and Transport assesses the magnitude of impact on human receptors. The human health effects from changes in transport nature and flow rate are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but is not of an order of magnitude sufficient to quantify any change in baseline health outcome. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.1.15 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to transport nature and flows is considered to be uniformly **high**.

Significance of effect

- 4.1.16 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.1.17 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.1.18 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from income and employment generation

Magnitude of impact

- 4.1.19 Having a consistent income and being in long-term employment are two of the most important wider determinants of health. The construction phase of the proposed development would offer a number of job opportunities; while job opportunities would vary in type, the majority of jobs available would be for construction workers. This would be an indirect impact which, dependent on procurement, has the potential to benefit construction workers in neighbouring districts surrounding Thurrock Borough Council. However, it is anticipated that the majority of workers would be sourced from within Thurrock Borough Council.
- 4.1.20 Volume 3, Chapter 8: Land Use, Agriculture and Socio-Economics assesses the magnitude of impact on human receptors. The human health effects from income and employment generation are predicted to be primarily of local spatial extent and short term duration. It is predicted that the impact will affect the receptor directly through employment and indirectly via indirect and induced income and employment opportunities important to health. However, the magnitude of direct, indirect and induced income and employment opportunities are not sufficient to quantify any change in baseline health. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.1.21 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from income and employment generation is considered to be uniformly **high**.

Significance of effect

- 4.1.22 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.1.23 No further mitigation or enhancement measures are recommended.

Residual effect

- 4.1.24 The residual effect following no mitigation or enhancement is predicted to remain **minor** beneficial, which is not significant in EIA terms.

Future monitoring

- 4.1.25 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

4.2 Operational and maintenance phase

Human health effects from changes to air quality

Magnitude of impact

- 4.2.1 During operation, due to the nature of the fuel the predominant facility emission contribution will be NO₂ resulting from the gas engine exhaust stacks. The magnitude of impact on human health is derived using process contribution information detailed in Volume 3, Chapter 12: Air Quality.
- 4.2.2 As detailed in Chapter 12: Air Quality, any increase in local NO₂ levels directly attributable to the proposed development is predicted to remain below air quality objective thresholds set to be protective of the environment and health, and the relative change in concentration and exposure are not of a level to quantify any change in baseline health. The magnitude of impact on human health is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.2.3 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to air quality is considered to be **high**.

Significance of effect

- 4.2.4 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.2.5 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.2.6 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes in noise exposure

Magnitude of impact

- 4.2.7 Due to the nature of the proposed development (providing additional capacity during peak demand), operational activities will generally coincide when populations are active, with limited operation that might impact upon sleep.
- 4.2.8 As such, the proposed development has the potential to directly contribute to human health effects from annoyance (during the day) and limited risk of sleep disturbance.
- 4.2.9 On the basis that changes in background noise concentration is linearly associated with increases in annoyance and sleep disturbance, the magnitude of potential human health effects resulting from annoyance and sleep disturbance is derived using information detailed in Volume 3, Chapter 11: Noise and Vibration.
- 4.2.10 The human health effects from changes in noise exposure are predicted to be of local spatial extent, short term duration and intermittent (i.e. during peak demand). It is predicted that the impact will affect the receptor directly, and will not be of a magnitude, timing, duration or exposure sufficient to quantify any change in health baseline. The magnitude of impact on human health is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.2.11 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes in noise exposure is considered to be uniformly **high**.

Significance of effect

- 4.2.12 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.2.13 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.2.14 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes to transport nature and flow rate

Magnitude of impact

- 4.2.15 Operational human health effects from transport movements are limited to risk of accident and injury and severance. In this instance, there will only be the occasional maintenance vehicle visits and staff visits, but no significant full-time workforce will be required.
- 4.2.16 Volume 3, Chapter 10: Traffic and Transport assesses the magnitude of impact on human receptors. The human health effects from changes in transport nature and flow rate are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but will not be of magnitude or exposure sufficient to quantify any change in baseline health. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.2.17 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to transport nature and flow rate is considered to be **high**.

Significance of effect

- 4.2.18 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.2.19 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.2.20 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from income and employment generation

Magnitude of impact

- 4.2.21 Having a consistent income and being in long-term employment are two of the most important wider determinants of health. Due to the un-manned nature of the proposed development, the operation phase of the proposed development would support limited long-term employment opportunities that largely constitute maintenance and off-site control jobs. This would be an indirect impact which is unlikely to provide any local benefit.

- 4.2.22 The human health effects from income and employment generation are minimal and are predicted to affect the receptor indirectly, and while beneficial, are not of a level to change the health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.2.23 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from income and employment generation is considered to be **high**.

Significance of effect

- 4.2.24 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.2.25 No further mitigation or enhancement measures are recommended.

Residual effect

- 4.2.26 The residual effect following no mitigation or enhancement is predicted to remain **minor** beneficial, which is not significant in EIA terms.

Future monitoring

- 4.2.27 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

4.3 Decommissioning phase

Human health effects from changes to air quality

Magnitude of impact

- 4.3.1 In the instance where after 35 years of operation it is decided that decommissioning of the proposed development is considered appropriate, it is anticipated that the human health effects from changes to air quality would remain similar to the construction phase.
- 4.3.2 Volume 3, Chapter 12: Air Quality assesses the magnitude of impact at human receptors. As such, the human health effects from changes to air quality are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but will not be of a concentration sufficient to quantify any change in health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.3.3 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population, particularly during the decommissioning phase. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to air quality is considered to be **high**.

Significance of effect

- 4.3.4 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.3.5 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.3.6 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes in noise exposure

Magnitude of impact

- 4.3.7 In the instance where after 35 years of operation it is decided that decommissioning of the proposed development is considered appropriate, it is anticipated that the human health effects from changes in noise exposure would remain similar to the construction phase.
- 4.3.8 Volume 3, Chapter 11: Noise and Vibration assesses the magnitude of impact at human receptors. As such, the human health effects from changes in noise exposure are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, albeit with minimal exposure, and not of a magnitude sufficient to quantify any change in health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

- 4.3.9 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes in noise exposure is considered to be **high**.

Significance of effect

- 4.3.10 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 4.3.11 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 4.3.12 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from changes to transport nature and flow rate

Magnitude of impact

- 4.3.13 In the instance where after 35 years of operation it is decided that decommissioning of the proposed development is considered appropriate, it is anticipated that the human health effects from changes to transport nature and flow rate would remain similar to the construction phase.

4.3.14 Volume 3, Chapter 10: Traffic and Transport assesses the magnitude of impact on human receptors. As such, the human health effects from changes in transport nature and flow rate are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor directly, but will not be of magnitude or exposure sufficient to quantify any change in health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

4.3.15 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to transport nature and flow rate is considered to be **high**.

Significance of effect

4.3.16 Overall, it is predicted that the **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

4.3.17 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

4.3.18 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Human health effects from income and employment generation

Magnitude of impact

4.3.19 In the instance where after 35 years of operation it is decided that decommissioning of the proposed development is considered appropriate, it is anticipated that the human health effects from income and employment generation would remain similar to the construction phase.

4.3.20 As such, the human health effects from income and employment generation are predicted to be primarily of local spatial extent and short term duration. It is predicted that the impact will affect the receptor indirectly, but will not be of level sufficient to quantify any change in health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

4.3.21 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from income and employment generation is considered to be **high**.

Significance of effect

4.3.22 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

4.3.23 No further mitigation or enhancement measures are recommended.

Residual effect

4.3.24 The residual effect following no mitigation or enhancement is predicted to remain **minor** beneficial, which is not significant in EIA terms.

Future monitoring

4.3.25 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

4.4 Transboundary effects

4.4.1 A screening of transboundary impacts has been carried out and is presented in Volume 5, Appendix 4.2: Transboundary Impacts Screening Note. This screening exercise identified that there was no potential for significant transboundary effects with regard to human health from Thurrock Flexible Generation Plant upon the interests of other EEA States.

4.5 Inter-related effects

4.5.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the construction, operation or decommissioning of Thurrock Flexible Generation Plant on the same receptor. The following assessments have been made and a description of the likely inter-related effects on human health is provided in Volume 4, Chapter 17: Summary of Inter-Related Effects.

Project lifetime effects

- 4.5.2 Assessment of the potential for effects that occur during more than one stage of the development's lifetime (construction, operation or decommissioning) to interact such that they may create a more significant effect on a receptor than when assessed in isolation for each stage.

Receptor-led effects

- 4.5.3 Assessment of the potential for effects via multiple environmental or social pathways to interact, spatially and temporally, to create a greater inter-related effect on a receptor than is predicted for each pathway (in its respective topic chapter) individually.

5. Cumulative Effects Assessment

5.1 Introduction

- 5.1.1 The process of identifying other consented or proposed developments and screening to create a shortlist of those having potential for cumulative effects with Thurrock Flexible Generation Plant is described in Volume 2, Chapter 4: Environmental Impact Assessment Methodology and Volume 5, Appendix 4.1: Cumulative Developments and Screening. Appendix 4.1 lists the shortlisted cumulative developments and the tier they have been assigned (guiding the weight that the decision-maker may place on each development's likelihood of being realised) in accordance with PINS Guidance Note 17 (PINS, 2015).
- 5.1.2 Cumulative developments shortlisted are those that have potential to contribute impacts affecting receptors also affected by the proposed development (for example, contributing additional traffic to the same road links), or that introduce additional sensitive receptors (for example, new residences or school closer to the proposed development than existing), or both.
- 5.1.3 The cumulative effects assessment for human health has been undertaken in two stages, reported as follows. In the first stage, cumulative effects of the proposed development have been considered in an overall scenario where the land surrounding the proposed development could be largely transformed by three adjacent NSIP developments and the possible expansion of nearby residential and employment uses to the east. This is referred to as the 'max development' scenario.
- 5.1.4 In the second stage, cumulative effects with specific individual development projects have been assessed where these would affect a particular environmental pathway or receptor for human health. Only shortlisted developments with potential cumulative effects specific to human health are assessed in this chapter.

5.2 Cumulative effects in 'max development' scenario

- 5.2.1 Three NSIP developments are proposed on land adjacent to and in some cases overlapping with the Thurrock Flexible Generation Plant application boundary. The Tilbury2 port expansion adjacent to the west is at examination stage (Tier 1). The Tilbury Energy Centre (TEC) power station to the south and Lower Thames Crossing (LTC) motorway and link road to the east and north are both at EIA scoping stage (Tier 2).

- 5.2.2 Outline planning permission has been granted for several residential and mixed-use developments expanding Linford and East Tilbury in the direction of Thurrock Flexible Generation Plant (Tier 1).
- 5.2.3 Should all of these developments proceed, Thurrock Flexible Generation Plant's main development site would be in close proximity to the temporary or permanent works areas of the listed NSIPs. While there is some uncertainty regarding projects so far from final design, there is the potential that the Thurrock Flexible Generation Plant's gas connection point to Feeder 18 might be adjacent to the expanded outskirts of Linford and also potentially to the TEC gas connection. Its cooling pipe route and intake/outfall could be under or adjacent to the LTC and would cross the route of either of the TEC gas connection options.
- 5.2.4 The Thurrock Core Strategy (2015) allocates land for possible strategic employment provision and sustainable economic growth to the west of the proposed development and to the east where there is existing industry at East Tilbury. Thurrock Borough Council is drafting a new Local Plan to replace the Core Strategy. The Issues and Options (Stage 2) consultation document proposals map of July 2018 (withdrawn temporarily due to recent NPPF changes) suggested possible zones for residential and commercial/employment development in areas east of the proposed development, where this would be facilitated by the Lower Thames Crossing project. However, these Tier 3 development possibilities are afforded only limited weight due to the early stage of this local plan development process.
- 5.2.5 In the 'max development' scenario set out in paragraphs 5.2.1 to 5.2.3 above, there is the potential for a cumulative increase in construction and operational environmental emissions (i.e. air quality, noise), and broader hazards (i.e. transport, socio-cultural) between the Thurrock Flexible Generation Plant and the other proposed NSIP developments. The magnitude, distribution and significance of cumulative effect is subject to a range of factors, including programme, design and appropriate mitigation (including TMP, CoCP, staff recruitment and management plan etc.) for each NSIP. As such, the potential cumulative hazards and opportunities (socio-economic and any supporting infrastructure) are well known, understood and can be assessed and addressed through appropriate design.

5.2.6 When considering each of the potential cumulative health pathways for all of the proposed NSIP developments, it should be noted that the Thurrock Flexible Generation Plant is likely to form only a minor contribution to environmental health determinants by comparison to the other proposed NSIP developments. This is concluded firstly on the basis that once operational, the magnitude of environmental health pathways associated with Thurrock Flexible Generation Plant (i.e. on the main development site) are of a smaller scale; are of an intermittent nature (i.e. operates during peak periods); and is located further from existing and proposed residential receptors (as outlined in the 'max development' scenario), and as such would constitute a negligible contribution and the lesser source of any cumulative impact.

5.3 Cumulative effects via environmental health determinants

Construction phase

Magnitude of impact

5.3.1 The potential cumulative human health effects resulting from changes in air quality during construction remain similar for each proposed NSIP development, and is limited to annoyance from nuisance dust generated from on-site construction activities and through track out from associated transport movements. This is also the case for noise exposure where construction activities are anticipated to be limited to day time hours only (i.e. no night time effects) which limits cumulative annoyance from a reduction in local amenity.

5.3.2 Potential changes to transport nature and flow rate during construction would also remain similar for each proposed NSIP development and includes: increased risk of accident and injury; feelings of isolation from increased severance; and loss of amenity from increased severance.

5.3.3 Overall, the cumulative human health effects during the construction phase are predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the cumulative impact has the potential to affect the receptor directly, but will not be of a concentration, duration or exposure to quantify any change in local health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

5.3.4 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to environmental health determinants is considered to be **high**.

Significance of effect

5.3.5 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

5.3.6 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

5.3.7 The residual effect following no mitigation or enhancement is predicted to be **minor** adverse, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

5.3.8 Some proposed NSIP developments have a higher potential to contribute to certain environmental health determinants compared to others. While all proposed NSIP developments have the potential to contribute to increases in noise exposure, the proposed NSIP developments with the highest potential to contribute to air pollution are the LTC motorway and TEC power station. The LTC motorway also has a high potential to contribute to a change in transport nature and flow rate, as does the Tilbury2 port expansion.

5.3.9 As such, the cumulative human health effects from changes to environmental health determinants are dependent on which developments are approved. Overall, it is expected that contributions to environmental health determinants from all proposed NSIP developments would be designed to comply with objective thresholds set to be protective of the environment and health, and would not be of a magnitude or exposure sufficient to significantly influence the health baseline. On this basis, the magnitude is considered to be **minor**.

Sensitivity of the receptor

5.3.10 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes to environmental health determinants is considered to be **high**.

Significance of effect

5.3.11 Overall, it is predicted that **minor** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 5.3.12 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 5.3.13 The residual effect following no mitigation or enhancement is predicted to be **minor** adverse, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

- 5.3.14 Where after 35 years of operation it is decided that decommissioning of the Thurrock Flexible Generation Plant is considered appropriate, it is anticipated that the cumulative human health effects from changes to environmental health determinants would be less than, or remain similar to the construction phase. As a result, the magnitude is considered to be **negligible**.

Sensitivity of the receptor

- 5.3.15 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, a precautionary approach has been applied, where the sensitivity of residential receptors to human health effects from changes in environmental health determinants is considered to be **high**.

Significance of effect

- 5.3.16 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 5.3.17 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 5.3.18 The residual effect following no mitigation or enhancement is predicted to be **minor** adverse, which is not significant in EIA terms.

Future monitoring

- 5.3.19 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

5.4 Cumulative effects via socio-economic health determinants

Construction phase

Magnitude of impact

- 5.4.1 The construction of all developments in unison would offer a larger magnitude of construction-related jobs at any one point in time, potentially to the extent that the local construction workforce would not be able to meet the construction job demand. In this instance, construction workers would have to be sourced from further afield. On the other hand, the construction of all developments in a staggered manner would offer more in the way of a sustained socio-economic benefits and job retention for locally based construction workers who could move from one development to the other (i.e. a lower magnitude of demand for a longer duration).

- 5.4.2 Volume 3, Chapter 8: Land Use, Agriculture and Socio-Economics assesses the magnitude of impact on human receptors. In the instance where all developments are constructed in unison, the cumulative human health effects from income and employment generation are predicted to be primarily of a regional extent and short term duration. It is predicted that the impact will affect the receptor indirectly, and has the potential to address a number of factors underlying existing burdens of poor health. The magnitude is therefore considered to be **minor**.

- 5.4.3 In the instance where all developments are constructed in a staggered manner, the cumulative human health effects from income and employment generation are predicted to be primarily of a local extent and long term duration. It is predicted that the impact will affect the receptor indirectly and has the potential to address a number of factors underlying existing burdens of poor health. The magnitude is therefore considered to be **minor**.

Sensitivity of the receptor

- 5.4.4 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects from income and employment generation is considered to be **high**.

Significance of effect

- 5.4.5 It is predicted that **minor** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

5.4.6 Although the employment generation of Thurrock Flexible Generation Plant is likely to be minor compared to the other proposed NSIP developments, we are aware of the benefits of a joined up strategic approach to training programmes and management of occupational health needs.

5.4.7 Where such an approach is considered beneficial (i.e. where there is a significant amount of simultaneous construction), the developer would consider participation in a strategic training and/or employment strategy with Thurrock Borough Council.

Residual effect

5.4.8 In both instances, the residual effect following no mitigation or enhancement is predicted to be **minor** beneficial, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

5.4.9 It is unlikely that the operation of all proposed developments would support any meaningful number of income and employment opportunities as the majority of jobs would constitute maintenance and off-site control jobs.

5.4.10 Overall, the cumulative human health effects from income and employment generation are minimal. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

5.4.11 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects from income and employment generation is considered to be **high**.

Significance of effect

5.4.12 Overall, it is predicted that **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

5.4.13 No further mitigation or enhancement measures are recommended.

Residual effect

5.4.14 The residual effect following no mitigation or enhancement is predicted to remain **minor** beneficial, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

5.4.15 The majority of proposed developments would be permanent structures and therefore would not be decommissioned – specifically, the residential developments, Tilbury2 port expansion and the LTC motorway.

5.4.16 In the instance where after 35 years of operation it is decided that decommissioning of Thurrock Flexible Generation Plant is considered appropriate, it is expected that the cumulative human health effects from income and employment generation would be primarily of a local extent and short term duration. It is predicted that the impact will affect the receptor indirectly, but will not be of a magnitude to alter the health baseline. The magnitude is therefore considered to be **negligible**.

Sensitivity of the receptor

5.4.17 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects from income and employment generation is considered to be **high**.

Significance of effect

5.4.18 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** beneficial effect, which is not significant in EIA terms.

Further mitigation or enhancement

5.4.19 No further mitigation or enhancement measures are recommended.

Residual effect

5.4.20 The residual effect following no mitigation or enhancement is predicted to remain **minor** beneficial, which is not significant in EIA terms.

Future monitoring

5.4.21 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

5.5 Cumulative effects from the introduction of residential receptors

Construction phase

Magnitude of impact

- 5.5.1 There is the potential for a higher magnitude of impact during construction where proposed cumulative developments extend the residential areas of Linford and East Tilbury towards the proposed NSIP developments, including the Thurrock Flexible Generation Plant.
- 5.5.2 While the construction of proposed NSIP developments, including the Thurrock Flexible Generation Plant, would generate short term and intermittent impacts, local community receptors could potentially be located in closer proximity to environmental pollution sources; and an increased number of local community receptors to be exposed to environmental pollution sources. On the other hand, there would be a larger local population to draw from for construction workers.
- 5.5.3 The construction of the residential developments themselves would remain similar to any other development whereby pollution sources are limited to nuisance dust, annoyance from increases in exposure to noise (provided that construction takes place during the day), and increased severance and risk of accident and injury from changes in transport nature and flow rate.
- 5.5.4 As such, the cumulative human health effects from the introduction of new residential receptors is considered to be **minor**.

Sensitivity of the receptor

- 5.5.5 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects is considered to be **high**.

Significance of effect

- 5.5.6 Overall, it is predicted that **minor** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 5.5.7 No significant adverse effects have been predicted and no further mitigation is considered to be required.

Residual effect

- 5.5.8 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

- 5.5.9 In the instance where the residential areas of Linford and East Tilbury are extended, there is the potential for a higher magnitude of impact during the operation of proposed NSIP developments, including the Thurrock Flexible Generation Plant. This is concluded on the basis that local community receptors could potentially encroach, and alter exposure scenarios to environmental and transport hazards. However, once operational, the Thurrock Flexible Generation Plant has minimal contribution to cumulative environmental hazards and does not present a cumulative risk to health.
- 5.5.10 Furthermore, the operation of the residential developments themselves would not be major sources of pollution, particularly for air quality and noise. The largest impacts associated with residential developments are likely to be increases in transport flow rate.
- 5.5.11 As such, the cumulative human health effects from the introduction of new residential receptors is considered to be **minor**.

Sensitivity of the receptor

- 5.5.12 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects is considered to be **high**.

Significance of effect

- 5.5.13 Overall, it is predicted that **minor** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 5.5.14 No further mitigation or enhancement measures are recommended.

Residual effect

- 5.5.15 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Decommissioning phase

Magnitude of impact

- 5.5.16 Where after 35 years of operation it is decided that decommissioning of Thurrock Flexible Generation Plant is considered appropriate, it is anticipated that the cumulative magnitude of human health effects will be consistent with operation, and the introduction of residential receptors would not alter the conclusion, remaining **negligible**.

Sensitivity of the receptor

- 5.5.17 As described in paragraph 2.6.3, it is not possible to allocate a fair or accurate sensitivity classification to a population. On this basis, the sensitivity of residential receptors to human health effects is considered to be **high**.

Significance of effect

- 5.5.18 Overall, it is predicted that a **negligible** magnitude of impact on the **high** sensitivity receptor would result in a **minor** adverse effect, which is not significant in EIA terms.

Further mitigation or enhancement

- 5.5.19 No further mitigation or enhancement measures are recommended.

Residual effect

- 5.5.20 The residual effect following no mitigation or enhancement is predicted to remain **minor** adverse, which is not significant in EIA terms.

Future monitoring

- 5.5.21 Recommended monitoring focuses on environmental precursors to human health effects, thereby providing the opportunity for intervention to prevent any manifest health outcome. Recommended monitoring measures relating to human health are detailed within the relevant topic chapters.

6. Conclusion and summary

- 6.1.1 As shown in Table 6.1, it is not anticipated that there would be any significant human health effects resulting from the construction, operation or decommissioning of the proposed development. This has been concluded on the basis that any change in health determinant would not be sufficient to quantify any change in baseline health outcomes within the surrounding community.

6.2 Next Steps

- 6.2.1 Following submission of the PEIR, where there are changes to the design of the proposed development, the Human Health ES chapter would need to review any consequent changes outlined within the wider technical disciplines relevant to human health before producing the final ES chapter.

Table 6.1: Summary of potential environment effects, mitigation and monitoring.

Description of impact	Measures adopted as part of the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Construction							
Human health effects from changes to air quality	As per Chapter 12: Air Quality	Negligible	High	Minor	As per Chapter 12: Air Quality	Minor	As per Chapter 12: Air Quality
Human health effects from changes in noise exposure	As per Chapter 11: Noise and Vibration	Negligible	High	Minor	As per Chapter 11: Noise and Vibration	Minor	As per Chapter 11: Noise and Vibration
Human health effects from changes to transport nature and flow rate	As per Chapter 10: Traffic and Transport	Negligible	High	Minor	As per Chapter 10: Traffic and Transport	Minor	As per Chapter 10: Traffic and Transport
Human health effects from changes from income and employment generation	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Negligible	High	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics
Operation and maintenance							
Human health effects from changes to air quality	As per Chapter 12: Air Quality	Negligible	High	Minor	As per Chapter 12: Air Quality	Minor	As per Chapter 12: Air Quality
Human health effects from changes in noise exposure	As per Chapter 11: Noise and Vibration	Negligible	High	Minor	As per Chapter 11: Noise and Vibration	Minor	As per Chapter 11: Noise and Vibration
Human health effects from changes to transport nature and flow rate	As per Chapter 10: Traffic and Transport	Negligible	High	Minor	As per Chapter 10: Traffic and Transport	Minor	As per Chapter 10: Traffic and Transport
Human health effects from changes from income and employment generation	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Negligible	High	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics
Decommissioning (after 35 years decommissioning takes place)							
Human health effects from changes to air quality	As per Chapter 12: Air Quality	Negligible	High	Minor	As per Chapter 12: Air Quality	Minor	As per Chapter 12: Air Quality
Human health effects from changes in noise exposure	As per Chapter 11: Noise and Vibration	Negligible	High	Minor	As per Chapter 11: Noise and Vibration	Minor	As per Chapter 11: Noise and Vibration
Human health effects from changes to transport nature and flow rate	As per Chapter 10: Traffic and Transport	Negligible	High	Minor	As per Chapter 10: Traffic and Transport	Minor	As per Chapter 10: Traffic and Transport
Human health effects from changes from income and employment generation	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Negligible	High	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics	Minor	As per Chapter 8: Land Use, Agriculture and Socio-Economics

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