



Thurrock Flexible Generation Plant

Environmental Statement Volume 3
Chapter 8: Land Use, Agriculture and Socio-Economics

Date: February 2020

Environmental Impact Assessment

Environmental Statement

Volume 3

Chapter 8

Report Number: OXF10872

Version: Final

Date: February 2020

This report is also downloadable from the Thurrock Flexible Generation Plant website at:
<http://www.thurrockpower.co.uk>

Prepared by: Julia Tindale and Eunice Stephenson

Contributors: Richard Boothe

Checked by: Tom Dearing

Thurrock Power Ltd

1st Floor

145 Kensington Church Street

London W8 7LP

Copyright © RPS

The material presented in this report is confidential. This report has been prepared for the exclusive use of Thurrock Power Ltd and shall not be distributed or made available to any other company or person without the knowledge and written consent of RPS.

Table of Contents

1. Introduction.....	1
1.1 Purpose of this chapter	1
1.2 Planning policy context	1
1.3 Consultation	3
2. Assessment Approach.....	7
2.1 Overview	7
2.2 Baseline study.....	7
2.3 Study area.....	10
2.4 Uncertainties and/or data limitations	10
2.5 Impact assessment criteria	10
2.6 Maximum design envelope parameters for assessment	13
2.7 Impacts scoped out of the assessment	13
2.8 Measures adopted as part of Thurrock Flexible Generation Plant	16
3. Baseline environment	17
3.1 Soils and Agricultural Land Quality	17
3.2 Agricultural Land Classification – Detailed Survey Results	19
3.3 Farm Holdings.....	19
3.4 Other Land Uses	20
3.5 Socio-Economics	24
3.6 Future baseline	26
4. Assessment of Effects	27
4.1 Construction phase	27
4.2 Operational and maintenance phase	32
4.3 Decommissioning phase	33
4.4 Cumulative effects.....	33
4.5 Transboundary effects	33
4.6 Inter-related effects	33
5. Conclusion and summary	34
6. References	37

List of Tables

Table 1.1: Summary of NPS EN-1 provisions relevant to this chapter.....	1
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.....	4
Table 2.1: Summary of key desktop sources	7
Table 2.2: Summary of site-specific surveys undertaken.....	9

Table 2.3: Criteria for magnitude of impact	10
Table 2.4: Criteria for receptor sensitivity.....	11
Table 2.5: Matrix used for the assessment of the significance of an effect	13
Table 2.6: Maximum design envelope parameters assessed	14
Table 2.7: Impacts scoped out of the assessment	15
Table 2.8: Designed-in measures	16
Table 3.1: Soil Types in the Development Zones A to E	17
Table 3.2: Soil Types in the Development Zones F.....	17
Table 3.3: Climatic Data for Agricultural Land Classification.....	18
Table 3.4: Defra 2013-2016 Statistics for Breakdown on Key Crop Areas.....	19
Table 3.5: Qualification Levels of the Study Area Population 2018.....	24
Table 3.6: Employment by Occupation (April 2019-March 2019).....	24
Table 3.7: Employee Jobs by Industry 2017	25
Table 4.1: Permanent loss of Agricultural Land	27
Table 4.2: Temporary Effects on Agricultural Land	27
Table 5.1: Summary of potential environment effects, mitigation and monitoring	35

List of Figures

Figure 3.1: Auger Boring and Agricultural Land Classification Plan (Sheet 1).....	21
Figure 3.2: Auger Boring and Agricultural Land Classification Plan (Sheet 2).....	22
Figure 3.3: Auger Boring and Agricultural Land Classification Plan (Sheet 3).....	23

Summary

This chapter of the Environmental Statement (ES) presents the findings of Environmental Impact Assessment (EIA) work undertaken concerning the potential impacts of Thurrock Flexible Generation Plant on Land Use, Agricultural and Socio-economic receptors.

Qualifications

This document has been prepared by Julia Tindale, Eunice Stephenson and Richard Boothe.

Julia Tindale, BSc (Hons), Mi Soil Sci of RPS has carried out agricultural and land use assessment work for over 25 years including detailed agricultural land classification, farm holding, recreation (including published rights of way; common land) and community assessments.

Eunice Stephenson BA (Hons), Dip LA, LLM (Env. Law), MRTPI, ALI of RPS who has broad-ranging experience covering many aspects of planning and environmental impact assessment, including recreation and tourism assessments (including impacts on public access; public rights of way; common land etc.).

Richard Boothe BSc (Hons), Dip TP, MRTPI has developed expertise in assessing the socio-economic impact for a number of proposals over his 18-year career in the private sector and has prepared a many stand-alone reports and chapters for Environmental Impact Assessments on a broad range of projects.

1. Introduction

1.1 Purpose of this chapter

- 1.1.1 This chapter of the Environmental Statement (ES) presents the findings of Environmental Impact Assessment (EIA) work undertaken to date concerning potential impacts of Thurrock Flexible Generation Plant on Land Use, Agricultural and Socio-economic receptors.
- 1.1.2 The Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent.
- 1.1.3 Specifically, this chapter considers the potential impact of Thurrock Flexible Generation Plant on agricultural land use, common land, recreational resources and the socio-economic impacts associated with the generation of jobs during its construction, operation and maintenance, and decommissioning phases.
- 1.1.4 Those impacts of Thurrock Flexible Generation Plant that may impact on the visual and acoustic amenity of land use and recreational resources are assessed in Volume 3, Chapter 6: Landscape and Visual Resources and Volume 3, Chapter 11: Noise and Vibration.
- 1.1.5 This chapter summarises information contained within technical reports, which are included at Volume 6, Appendix 8.1: ALC and Soil Survey Data, Appendix 8.2: Common Land, and Appendix 8.3: Construction Labour Forecasting.
- 1.1.6 In particular, this ES chapter:
 - presents the existing environmental baseline established from desk studies, surveys and consultation to date;
 - presents the environmental effects on Land Use, Agriculture and Socio-economics arising from Thurrock Flexible Generation Plant, based on the information gathered and the analysis and assessments undertaken;
 - 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 environmental 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 Land Use, Agriculture and Socio-Economics, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1; DECC, 2011).
- 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 ES
The ES should set out information on the likely significant social and economic effects of the development and show how any likely significant negative effects would be avoided or mitigated. This information could include matters such as employment, equality, community cohesion and well-being (paragraph 4.2.2 of NPS EN-1).	The economic baseline environment has been identified, together with the potential effects on the local employment profile, in this chapter of the ES. Matters relating to equality, community cohesion and well-being are included in Volume 3, Chapter 13: Human Health of the ES.
The Environmental Statement should identify existing and proposed land uses near the project and assess the effects of the development (paragraph 5.10.5 of NPS EN-1).	The baseline environment has been identified, and an assessment of likely effects is included within this chapter of the ES.
Pre-application discussions between the applicant and the Local Authorities should identify any concerns regarding land use, having regard to the development plan and other relevant applications (paragraph 5.10.7 of NPS EN-1).	Consultation has been undertaken with relevant stakeholders during the development of the project proposals. Consultation has taken place with the Local Authorities to identify relevant proposed developments for cumulative assessment.
Applicants should seek to minimise effects on "best and most versatile" agricultural land except where this would be inconsistent with other sustainability considerations. Applicants should preferably use land in areas of poorer quality and should also identify any effects and seek to minimise impacts on soil quality (paragraph 5.10.8 of NPS EN-1).	This chapter of the ES identifies the effects on agricultural land and soils, including effects on "best and most versatile" agricultural land, together with measures proposed to be adopted as part of the project to minimise impacts on soil quality.
Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place (paragraph 5.10.9 of NPS EN-1).	This matter is addressed in Volume 3, Chapter 16: Geology, Hydrogeology and Ground Conditions of the ES.

Summary of NPS EN-1 provision	How and where considered in the ES
Paragraph 5.10.14 of NPS EN-1 states that consent should not be granted for development on existing open space, sports and recreational buildings and land unless they are surplus to requirements. The Secretary of State, when deciding if the benefits outweigh the potential loss of facilities, is to take into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities.	The baseline environment has been identified, together with the assessment of likely effects on recreational resources (including public rights of way and promoted routes), in this chapter of the ES.
Applicants should include appropriate mitigation measures to address adverse effects on coastal access, National Trails and other Public Rights of Way (PRoW) (paragraph 5.10.24 of NPS EN-1).	
Where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the ES (paragraph 5.12.2 of NPS EN-1). This assessment should consider all relevant socio-economic impacts, which may include, <i>inter alia</i> , the creation of jobs and training opportunities; and the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste) (paragraph 5.12.3 of NPS EN-1). Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies (paragraph 5.12.4 of NPS EN-1).	The socio-economic baseline environment has been identified, together with the likely effects on job creation and the influx of a construction workforce, in this chapter of the ES. Matters relating to other socio-economic conditions are included in Volume 3, Chapter 13: Human Health of the ES.

1.2.3 NPS EN-1 also highlights a number of factors 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 ES
The examining authority should ensure that developments are not located on the "best and most versatile" agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land except in areas where particular agricultural practices contribute to the quality and character of the environment or economy (NPS EN-1, 5.10.15).	The baseline soils and agricultural environment has been identified, together with the assessment of likely effects on these resources, in this chapter of the ES.
The examining authority should not grant consent for a development on existing open space, sports/recreational buildings or land unless an assessment to show the open space/land to be surplus to requirements has been undertaken or the benefits of the project outweigh the potential loss of such facilities, taking into account any positive proposals e.g. compensatory measures made by the applicant (NPS EN-1, 5.10.14).	
In considering the impact on maintaining coastal recreation sites and features, the Infrastructure Planning Commission should expect applicants to have taken advantage of opportunities to maintain and enhance access to the coast (paragraph 5.10.16 of NPS EN-1).	The baseline environment has been identified, together with the likely effects on recreational resources (including public rights of way, promoted routes and public access resources), in this chapter of the ES. It also identifies potential mitigation measures for the loss of recreational resources.
The examining authority should have regard to the potential socio-economic impacts of new energy infrastructure and should consider any relevant positive provisions the developer has made or is proposing to make to mitigate impacts.	The socio-economic baseline environment has been identified, together with the likely effects on job creation and the influx of a construction workforce, in this chapter of the ES. Where appropriate, mitigation measures are also described.

- 1.2.4 A number of other policies are potentially relevant to land use, agriculture and socio-economics.
- 1.2.5 National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019a):
 - Paragraph 80 states that planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt. Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development.
 - The NPPF highlights the importance of access to high quality open spaces and opportunities for sport and recreation to the health and well-being of communities

- (paragraph 96), and states that existing open space, sports and recreational buildings and land, should not be built on unless certain criteria are met (paragraph 97).
- The NPPF also highlights the need for planning policies and decisions to protect and enhance public rights of way and access, including taking opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails (paragraph 98).
 - In relation to conserving the natural environment, the NPPF states that planning policies and decisions should contribute to and enhance it by, *inter alia*, “recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland” (paragraph 170 (b)). Best and Most versatile agricultural land is described as “Land in grades 1, 2 and 3a of the Agricultural Land Classification” (Annex 2 - page 65).
- 1.2.6 The National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Government, 2019b) supports the NPPF and provides guidance across a range of topic areas. The following NPPG is relevant to this topic.
- The guidance includes the need to protect and enhance valued soils and to take into account the economic and other benefits of the “best and most versatile” agricultural land. Guidance in relation to recreational resources is provided under the headings of ‘Open space, sports and recreation facilities’ and ‘Public rights of way and National Trails’, which reiterates that PRoWs form an important component of sustainable transport links and should be protected or enhanced.
- 1.2.7 Thurrock Core Strategy (as amended, adopted 2015):
- Policy CSSP2 ‘Sustainable Employment Growth’ which includes the provision of economic opportunities within the key strategic economic hubs. This includes the energy growth sector in Tilbury.
 - Policy CSTP20 ‘Open Space’, which seeks to ensure that a diverse range of accessible public open spaces is provided and maintained to meet the needs of the local community.
 - Policy CSTP21 ‘Productive Land’, which recognises the importance of food security and will ensure the protection, conservation and enhancement of agriculture, productive land and soil in the Borough. It further states that the development of the best and most versatile land (DEFRA Grades 1, 2 and 3) will not be supported except in exceptional circumstances.
- Policy PMD5 ‘Open Spaces, Outdoor Sports and Recreational Facilities’ which safeguards all existing open spaces, outdoor sports and recreational facilities from development proposals, except in specific circumstances.
 - Policy PMD6 ‘Development in the Green Belt’ which seeks to maintain, protect and enhance the open character and the beneficial use of the Green Belt by looking for opportunities to provide access to the countryside, provide opportunities for outdoor sport and recreation, to retain and enhance landscapes, visual amenity and biodiversity, and to improve damaged and derelict land. Planning permission will only be granted for new development in the Green Belt in specific circumstances.
- 1.2.8 Legislation relevant to this topic includes the following:
- The Commons Act 2006, in relation to the loss of common land. Section 16 provides a replacement mechanism for the exchange of land which is registered under Part 1 of the Act.
 - The Countryside and Rights of Way Act 2000 in relation to the public right of access to areas of Access Land as defined by Part 1 of the Act.
- ## 1.3 Consultation
- 1.3.1 Key issues raised during scoping and consultation to date specific to Land Use, Agriculture and Socio-economics are listed in Table 1.3, together with how details of how these issues have been considered in the production of this ES and cross-references to where this information may be found.

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	Scoping Opinion: PINS	Study areas <ul style="list-style-type: none"> The ES should clearly describe the study areas relevant to the anticipated impacts to land use, agriculture and socio-economic receptors. The ES should include a clear justification in support of the study areas and ensure they are depicted on corresponding figures to aid understanding. It should be clear how the selected study areas relate to the extent of the likely impacts. 	The study area for this topic is described in Section 2.3.
		Socio-economics <ul style="list-style-type: none"> The Inspectorate agrees that on the basis of the information contained in the Scoping Report, the impacts from the Proposed Development are likely to be temporary. The Applicant should ensure that the assessment in the ES is sufficient to identify any likely significant effects but the Inspectorate considers that a 'proportionate' assessment using qualitative methods and professional judgement can be appropriate in this regard. Employment generation: The assessment should provide a breakdown of the likely jobs and roles created during each phase of the Proposed Development. Any proposed measures such as skills and training programmes or apprenticeships that would promote local employment should be discussed and effort made to agree them with relevant consultation bodies. The Inspectorate is also aware of a number of other proposed developments in proximity to the Proposed Development which have potential to be constructed over a similar timescale. There is potential for significant cumulative socio-economic effects from multiple large scale construction activities taking place within a relatively small area. The Inspectorate considers that the cumulative assessment of socio economic impacts should be appropriately focussed towards the construction phases of the Proposed Development and other relevant developments. Any potential impacts on local businesses/ commercial operations (for example, any impacts arising from road or footpath closures) should be described and assessed within the ES where significant effects are likely to occur. This should include the Port of Tilbury and if the water cooling pipeline option is taken forward, other commercial users of the river. Any cumulative impacts on local businesses/ commercial operations which are likely to result in significant effects should also be assessed. 	The baseline conditions and description of the likely effects on socio-economic receptors are described in Section 3 and Section 4 of this chapter of the ES. Cumulative effects associated with land use, agriculture and socio-economics are assessed in Volume 4, Chapter 21.
		Agriculture <ul style="list-style-type: none"> The ES should quantify the agricultural land which would be temporarily and permanently lost as a result of construction and operation of the Proposed Development (by Agricultural Land Classification (ALC) grade) and assess any impacts that may result in likely significant effects. Any impacts likely to result in significant effects on soil quality should also be described and assessed. The ES assessment of impacts to agricultural land should be undertaken with reference to appropriate guidance such as the Ministry of Agriculture, Fisheries and Food (MAFF) guidelines and Natural England's TIN0499. In relation to the loss of Common Land and the provision of replacement land, the Applicant should make effort to agree the replacement land provision with relevant consultation bodies notably Natural England. The ES should explain the extent to which the replacement land is of equivalent value to that being lost. The ES should provide details of how the replacement land would be managed and assess inter-related impacts (such as impacts on landscape and ecological receptors). Cross-reference should be made to the relevant ES aspect chapters. 	The baseline conditions and assessment of effects on agricultural land and common land are described in Section 3 and Section 4 of this chapter.
		Recreation <ul style="list-style-type: none"> It is not clear whether potential impacts on tourism and recreation would be assessed in the ES. Along with users of PRoW, any impacts likely to result in significant effects on the users of other types of recreational and tourism receptors in the surrounding area should be assessed including for example, nature reserves and visitors to the Tilbury and Coalhouse Forts. Cumulative impacts with other developments should be assessed where significant effects are likely to occur. 	Baseline recreation and tourist resources are described in Section 3, together with an assessment of effects on these resources in Section 4 where applicable. Cumulative effects associated with land use, agriculture and socio-economics are assessed in Volume 4, Chapter 21.

Date	Consultee and type of response	Points raised	How and where addressed
September 2018	Scoping Opinion: Thurrock Council	<p>Socio-economics</p> <p>In addition to the issues identified in Scoping Report, the following should also be considered in scope.</p> <ul style="list-style-type: none"> • Impact on local employment including; <ul style="list-style-type: none"> ◦ Skills, linkages to local education programmes and opportunities for pathways in to employment, apprenticeships and training ◦ Addressing unemployment in the local area, Tilbury, and the wider Borough of Thurrock • Impact on local businesses and scope for supporting the local economy including; <ul style="list-style-type: none"> ◦ Supply chains and opportunities to facilitate procurement of services and facilities from the local area, Tilbury, and the wider Borough of Thurrock. • Broader socio-economic impact on Tilbury and the wider Thurrock Borough through indirect impacts on local businesses and services generated by employees living in the locality and using local services. 	The baseline conditions and description of the likely effects on socio-economic receptors are described in Section 3 and Section 4 of this chapter of the ES.
September 2018	Scoping Opinion: Essex County Council	<p>Economic Growth, Regeneration and Skills</p> <ul style="list-style-type: none"> • It is recommended that the applicant considers the employment generation through the construction phase. In particular consideration should be given to datasets to quantify potential construction employment effects through the Construction Industry Training Board Labour Forecasting Tool. • Consideration should also be made to develop a supplementary planning document to develop a local employment legacy, skills and training needs for both the construction and operational phases. The construction phase could potentially see a number of skills pinch points and early consideration and engagement is needed to address these skills and local labour challenges. This may include the need for investment in the local skills provision in order to address skills issues and develop a skills legacy. • This should be considered cumulatively with the other NSIP projects within the immediate vicinity of the proposed site, namely the Lower Thames Crossing (LTC), Tilbury 2 and the Tilbury Energy Centre, which will also generate significant requirements for local employment and development of construction and engineering skills across the area. 	<p>The baseline conditions and description of the likely effects on socio-economic receptors, including the use of the Construction Industry Training Board Labour Forecasting Tool, are described in Section 3 and Section 4 of this chapter.</p> <p>Cumulative effects associated with land use, agriculture and socio-economics are assessed in Volume 4, Chapter 21.</p>
September 2018	Scoping Opinion: Natural England	<ul style="list-style-type: none"> • Common land: In relation to the loss of Common Land, NE advises that land being offered as replacement ("exchange land") should be of least equal value when compared to the land being replaced, in the context of (amongst other matters) the public interest. The EIA should consider the planned land management objectives for such mitigation land as there may be valuable opportunities to provide enhancement such as replacement meadow seeding to provide nectar for pollinators. The compatibility of common land mitigation and other ecological mitigation requirements should be carefully examined. • Access and recreation: NE encourages any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate. • Rights of way, Access Land, Coastal Access and National Trails: The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on any nearby National Trail. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced. • Soils and Agricultural Land Quality: Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 112 of the NPPF. We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as a natural resource in line with paragraph 109 of the NPPF. The applicant should consider the following issues as part of the Environmental Statement: <ul style="list-style-type: none"> ◦ The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved. This may require a detailed survey if one is not already available. For further information Natural England's 	<p>Replacement common land will be provided as set out in this chapter under 'Measures to be incorporated into the project' in Table 2.8.</p> <p>An assessment of effects on access land, other recreational resources and agricultural land quality is provided in Section 4 of this chapter.</p>

Date	Consultee and type of response	Points raised	How and where addressed
		<ul style="list-style-type: none"> ○ Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land also contains useful background information. ○ If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, e.g. one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 1.2 metres. ○ The Environmental Statement should provide details of how any adverse impacts on soils can be minimised. Further guidance is contained in the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites. 	
September 2018	Scoping Opinion: Port of Tilbury	<p>Socio-economic cumulative effects</p> <p>The Thurrock Flexible Generation Plant, together with Tilbury 2, the Lower Thames Crossing and the Tilbury Energy Centre will cumulatively create a sustained period of construction. This could have both positive and adverse effects on socio-economic outcomes, in terms of job creation, skills and training opportunities, and potential stresses on existing infrastructure and community networks. The local demographic profile is expected to be affected by the proposal, particularly if additional employees move to the study area.</p>	The baseline conditions and description of the likely effects on socio-economic receptors are described in Section 3 and cumulative effects associated socio-economics are assessed in Volume 4, Chapter 21.
October/November 2019	Open Spaces Society – formal consultation	<p>Further to ongoing discussions in relation to the iterative design of the proposed Thurrock Power Flexible Generation Plant the Open Spaces Society was formally consulted on project changes to in relation to the effects on common land. In response the OSS noted the revised proposals, particularly in relation to the provision of a link between the replacement common land, located north of the railway line, and Fort Road (and therefore with the residential area west of Fort Road) which they welcomed.</p>	The impacts on common land and the provision of replacement land is described in Section 4 of this chapter of the ES.
January 2020	Thurrock Council – formal consultation	<p>Having reviewed the proposed changes my most significant concern is regarding the proposed changes to Zone G. It is now proposed to create a causeway and access road to the Thames for construction traffic and for abnormal loads. In principle this is welcomed as it removes the need to use a number of historic lanes as haulage routes and avoids the need to crane loads over the railway which should address some previous landscape and heritage issues. However I am concerned that there is no mention made of the public footpath 146 that follows the north bank of the Thames. This is a well-used route known locally as the Two Forts Way and forms part of the Thames Estuary Path. It is also part of the England Coastal Access being proposed by Natural England. It is not clear whether it is proposed to keep this route open during construction albeit with safety and security measures in place or whether it would require a temporary closure.</p> <p>There is recognition that there will need to be a temporary diversion of public footpath 200. I am not aware that there have been any discussions with the council's rights of way officers concerning this; however in principle it is considered that there is scope to deliver a suitable alternative route on a short-term basis.</p>	Impacts on the use of Two Forts Way and Footpath 200 have been assessed in Section 4.1 of this chapter. As described there and in Chapter 2, Two Forts Way will be kept open during construction with appropriate management measures for safety. The temporary diversion of Footpath 200 has been agreed with the Thurrock Public Rights of Way Officer.

2. Assessment Approach

2.1 Overview

- 2.1.1 In addition to meeting the requirements of EIA as set out by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended), the land use, agriculture and socio-economic EIA assessment has taken into account the following guidance documents.
- DMRB Volume 11, LA109: Geology and Soils (Highways England et al., 2019b);
 - DMRB Volume 11, LA112: Population and Human Health (Highways England et al., 2019c);
 - National Planning Practice Guidance (NPPG) (Ministry of Housing, Communities and Local Government, 2019b);
 - Methods of Environmental and Social Impact Assessment 4th Edition, Riki Therivel and Graham Wood 2017;
 - Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment (IEMA, 2004);
 - National Planning Practice Guidance (NPPG): Environmental Impact Assessment, Department for Communities and Local Government (DCLG) (now Ministry of Housing, Communities and Local Government). Published March 2014 and updated March 2019;
 - Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2011); and
 - The Green Book: Appraisal and Evaluation in Central Government', HM Treasury 2003.
- 2.1.2 There is currently limited guidance setting out the preferred method for, or content of, an assessment of potential social and economic effects as part of an EIA. European Directive 2014/52/EU (Article 3 and Annex 4) states that effects on 'population' and 'material assets' should be assessed when undertaking EIA. In the absence of specific methodologies, the guidance listed above has been considered, together with other datasets to quantify potential construction employment effects. The Construction Industry Training Board (CITB) Labour Forecasting Tool has also been used.

2.2 Baseline study

Desktop study

- 2.2.1 Baseline information on land use, agriculture and socio-economics within the topic study area was collected through a detailed desktop review of existing studies and datasets. These are summarised at Table 2.1 below.

Table 2.1: Summary of key desktop sources.

Title	Source	Year	Author
1 inch to 1 mile ALC Sheets 161 (London NE) and 171 (London SE) and accompanying Reports	Ministry of Agriculture, Fisheries and Food	1971/1972	Ministry of Agriculture Fisheries and Food (MAFF)
Soils of Eastern England 1:250,000 and accompanying Regional Bulletin	Soil Survey of England and Wales	1984	Soil Survey of England and Wales 1983
Meteorological Office Climatological Data for ALC	Meteorological Office	1989	Meteorological Office
Published Detailed ALC Survey Data	Natural England at: http://publications.naturalengland.org.uk	Online	Natural England
Defra Farming Statistical Data	Defra	Online	Defra
MAGIC (Multi agency Geographic Information for the Countryside)	http://magic.defra.gov.uk/	Online	Defra
Register of Common Land and Village Greens	Thurrock Council	Current version	Thurrock Council
Register of Common Land and Village Greens	Essex County Council	Current version	Essex County Council
Public Rights of Way	https://www.thurrock.gov.uk/public-rights-of-way-in-thurrock	Online	Thurrock Council
Cycle Routes	https://www.sustrans.org.uk/national-cycle-network/	Online	Sustrans
Ordnance Survey mapping	Ordnance Survey	Online	Ordnance Survey

2011 Census Data	https://www.nomisweb.co.uk/census/2011	Online	Office for National Statistics
NOMIS (Official Labour Market Statistics)	https://www.nomisweb.co.uk/	Online	Office for National Statistics

- 2.2.2 The desktop study undertaken to identify existing baseline conditions in relation to agricultural land use and soils focused on:
- Soil types and patterns of soils through the Thurrock Flexible Generation Plant land use and agricultural study area;
 - Quality of the agricultural land determined by the application of the MAFF ALC system 1988 which classifies agricultural land from Grade 1 (excellent quality agricultural land) to Grade 5 (very poor quality agricultural land), with Grades 1, 2 and Subgrade 3a defined as the “best and most versatile” agricultural land; and
 - Nature and pattern of farm holdings within the Thurrock Flexible Generation Plant land use and agricultural study area.
- 2.2.3 The assessment includes consideration of the published data set out in Table 2.1, British Geological Survey Internet Portal (British Geological Survey, n.d.) and Natural England Access to Evidence published ALC data (Reports and Maps) contained in Volume 6, Appendix 8.1: ALC and Soil Survey Data.
- 2.2.4 Information on the pattern of agricultural land use and the farming framework likely to be affected has been collated from Defra Farming Statistical Data (Defra, 2019a). Statistical data is available for 2013 and 2016 from the government website (Defra, 2019b).
- 2.2.5 In addition to the farming statistical information collated, specific information relevant to land holdings within the Thurrock Flexible Generation Plant land use and agricultural study area has been collected from the landowner’s agents.
- 2.2.6 The baseline conditions for recreational resources, including land used by the community (e.g. common land), recreational facilities (e.g. the coast; visitor attractions) and PRoW and other linear recreational routes, were established using data collected from a desktop study to identify those recreational resources within, and in proximity to, the proposed Thurrock Flexible Generation Plant development. This was followed by a site visit in Summer 2019 to establish the nature and condition of those resources.

2.2.7 In addition to the resources listed in Table 2.1 above, source material for the recreation desktop study has included Ordnance Survey (OS) mapping and online information about tourism/recreation facilities available from the local authority and other web-based resources.

2.2.8 Socio-economic data has been collated from the 2011 Census and NOMIS to provide a baseline labour market profile for the local authority area of Thurrock, including the most recently available figures on the resident population; employment and unemployment; economic inactivity and employment by occupation. Data from the Ministry of Housing, Communities and Local Government has been collated on the level of deprivation in the study area.

Site specific surveys

2.2.9 A summary of surveys that have informed the ES are outlined in Table 2.2 below:

Table 2.2: Summary of site-specific surveys undertaken.

Title	Extent of survey	Overview of survey	Survey provider	Year	Reference to further information
Site visit	Common land	Site walkover and visit to Council Offices to inspect the Register of Common Land and Village Greens.	Statera	August 2018	Section 3 Baseline Conditions in this ES chapter
ALC survey	Areas of agricultural land temporarily and permanently affected by Thurrock Flexible Generation Plant	The survey comprised: <ul style="list-style-type: none"> A detailed ALC survey of area where there would be temporary and permanent loss of agricultural land comprising hand auger borings taken at approximately 100m intervals across the area. A survey of the soil physical characteristics and ALC of the proposed Common replacement land. 	RPS	Summer 2019	Section 3 Baseline Conditions in this ES chapter
Recreation Survey	Areas of common land (release and exchange land) and PRoW	A walkover survey to confirm the nature and condition of these resources.	RPS	Summer 2019	Section 3 Baseline Conditions in this ES chapter

2.3 Study area

- 2.3.1 The Thurrock Flexible Generation Plant land use and agriculture study area comprises the land use resources that would be occupied by, or immediately adjacent to the proposed development during the construction, operational and decommissioning phases. This study area has been selected as it represents the area in which the land use and agricultural impacts are likely to occur.
- 2.3.2 The study area for farm holdings considers the farm holdings as a whole which may be affected by the development and therefore is based on the known ownership boundaries of those farms with land that fall within the temporary and permanent development areas.
- 2.3.3 The socio-economic study area comprises the local authority area of Thurrock within which the development would be located, as this is the most appropriate level at which baseline information is available.

2.4 Uncertainties and/or data limitations

- 2.4.1 No data limitations have been identified in the preparation of this ES chapter with regards to land use or agriculture.
- 2.4.2 The evaluation of baseline assessment conditions has been undertaken using the best available data, which are principally the 2011 Census and Labour Market Profiles from NOMIS. Although the 2011 census data are now over eight years old, they still form an important part of any socio-economic assessment as they are reliable, comprehensive and consistent. NOMIS data are more up to date. However, the explanatory notes to the NOMIS profiles draw attention to the small sample sizes involved.
- 2.4.3 Before a project has gone out to tender, it is not possible to know with certainty the level of employment that would be generated during the construction phase and therefore the best available information and tools based on the likely construction activities and phasing have been used to estimate the likely level.
- 2.4.4 Nevertheless, the assessment is based on well-established methods of assessment and is based on a reasonable level of information about the construction and operation of the Thurrock Flexible Generation Plant. Therefore, it is considered that the information presented within this chapter provides a robust basis for the assessment.

2.5 Impact assessment criteria

- 2.5.1 The criteria for determining the significance of effects is a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign the magnitude of potential impacts on land use and agricultural receptors and values to the sensitivity of those receptors. The terms used to define sensitivity and magnitude are based on those used in the DMRB methodology.
- 2.5.2 There is currently no definitive guidance or regulation setting out the preferred methodology or content for assessing socio-economic effects as part of an EIA. This chapter therefore provides a qualitative assessment of the likely impacts and has been prepared using specialist knowledge and professional experience gained through carrying out studies in respect of other projects.

Table 2.3: Criteria for magnitude of impact.

Magnitude of impact	Definition used for land use (including recreational) receptors	Definition used for agricultural receptors
Major	<p>Community land and assets:</p> <ul style="list-style-type: none"> Loss of resource and/or quality and integrity of resource; sever damage to key characteristics, features or elements e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. <p>Walkers, cyclists, horse riders:</p> <p>>500m increase (adverse) or decrease (beneficial) in journey length.</p>	<p>Soils:</p> <p>Physical removal or permanent sealing of more than 20ha of agricultural land.</p> <p>Agricultural land holdings:</p> <p>Loss of resource and/or quality and integrity of resource; sever damage to key characteristics, features or elements e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or</p> <p>Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision.</p>

Magnitude of impact	Definition used for land use (including recreational) receptors	Definition used for agricultural receptors
Moderate	<p>Community land and assets:</p> <ul style="list-style-type: none"> Partial loss of/damage to key characteristics, features or elements e.g. partial removal or substantial amendment to access or acquisition of land compromising the viability of community assets; and/or Introduction (adverse) or removal (beneficial) of severe severance with limited/moderate accessibility provision. <p>Walkers, cyclists, horse riders:</p> <p>>250m-500m increase (adverse) or decrease (beneficial) in journey length.</p>	<p>Soils:</p> <p>Physical removal or permanent sealing on 1 – 20ha of agricultural land; or</p> <p>Permanent loss/reduction of one or more soil function(s) and restriction to current or approved future use</p> <p>Agricultural land holdings:</p> <p>Partial loss of/damage to key characteristics, features or elements e.g. partial removal or substantial amendment to access or acquisition of land compromising the viability of agricultural holdings; and/or</p> <p>Introduction (adverse) or removal (beneficial) of severe severance with limited/moderate accessibility provision.</p>
Minor	<p>Community land and assets:</p> <ul style="list-style-type: none"> A discernible change in attributes, quality or vulnerability, or alteration to one (maybe more) key characteristics, features or elements e.g. amendment to access or acquisition of land resulting in changes to the operating conditions that do not compromise overall viability of community assets; and/or Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. <p>Walkers, cyclists, horse riders:</p> <p>>50m-250m increase (adverse) or decrease (beneficial) in journey length.</p>	<p>Soils:</p> <p>Temporary loss/reduction of one or more soil function(s) and restriction to current or approved future use.</p> <p>Agricultural land holdings:</p> <p>A discernible change in attributes, quality or vulnerability, or alteration to one (maybe more) key characteristics, features or elements e.g. amendment to access or acquisition of land resulting in changes to the operating conditions that do not compromise overall viability of agricultural holdings; and/or</p> <p>Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.</p>
Negligible	<p>Community land and assets:</p> <ul style="list-style-type: none"> Very minor loss or detrimental alteration to one or more characteristics, features or elements e.g. acquisition of non-operational land or buildings not directly affecting the viability of community assets; and/or Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. <p>Walkers, cyclists, horse riders:</p> <p><50m increase (adverse) or decrease (beneficial) in journey length.</p>	<p>Soils:</p> <p>No discernible loss/reduction in soil function(s) that restrict current or approved future use.</p> <p>Agricultural land holdings:</p> <p>Very minor loss or detrimental alteration to one or more characteristics, features or elements e.g. acquisition of non-operational land or buildings not directly affecting the viability of agricultural holdings; and/or</p> <p>Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision.</p>

Magnitude of impact	Definition used for land use (including recreational) receptors	Definition used for agricultural receptors
No change	<p>Community land & assets and walkers, cyclists, horse riders:</p> <p>No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.</p>	<p>Soils:</p> <p>No loss/reduction of soil function(s) that restrict current or approved future use.</p> <p>Agricultural land holdings:</p> <p>No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.</p>

2.5.3 The criteria for defining sensitivity in this chapter are outlined in Table 2.4.

Table 2.4: Criteria for receptor sensitivity.

Sensitivity	Description used for land use (including recreational) receptors	Description used for agricultural receptors
Very High	<p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> Complete severance between communities and their land/assets, with little/no accessibility provision; Alternatives are only available outside the local planning authority area; The level of use is very frequent (daily); and The land and assets are used by the majority (>=50%) of the community. <p>Walkers, cyclists, horse riders:</p> <ul style="list-style-type: none"> National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient route. Little/no potential for substitution; Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs; and <p>Rights of way crossing roads at grade with >16,000 vehicles per day.</p>	<p>Grade 1 and 2 agricultural land.</p> <p>Agricultural land holdings: Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and</p> <p>Access between land and key agricultural infrastructure is required on a frequent basis (daily).</p>

High	<p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • There is substantial severance between communities and their land/assets, with limited accessibility provision; • Alternative facilities are only available in the wider local planning authority area; • The level of use is frequent (weekly); and • The land and assets are used by the majority ($>=50\%$) of the community. <p>Walkers, cyclists, horse riders:</p> <ul style="list-style-type: none"> • Regional trails and routes likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and <p>Rights of way crossing roads at grade with $>8,000 - 16,000$ vehicles per day.</p>	Grade 3a agricultural land. Agricultural land holdings: Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and Access between land and key agricultural infrastructure is required on a frequent basis (weekly).		Community land and assets where there is a combination of the following: <ul style="list-style-type: none"> • Limited existing severance between communities and their land/assets, with existing full Disability Discrimination Act compliant accessibility provision; • Alternative facilities are available at a local level within the wider community; • The level of use is infrequent (monthly or less frequent); and • The land and assets are used by the minority ($>=50\%$) of the community. <p>Walkers, cyclists, horse riders:</p> <ul style="list-style-type: none"> • Routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for utility/recreational purposes; and/or <p>Rights of way crossing roads at grade with $<4,000$ vehicles per day.</p>	Grades 4 or 5 agricultural land. Agricultural land holdings: Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent).
Medium	<p>Community land and assets where there is a combination of the following:</p> <ul style="list-style-type: none"> • There is severance between communities and their land/assets, but with existing accessibility provision; • Limited alternative facilities are available at a local level within adjacent communities; • The level of use is reasonably frequent (monthly); and • The land and assets are used by the majority ($>=50\%$) of the community. <p>Walkers, cyclists, horse riders:</p> <ul style="list-style-type: none"> • Public rights of way and other routes close to communities which are used for recreational purposes, but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer recreational journeys, and/or <p>Rights of way crossing roads at grade with $>4,000 - 8,000$ vehicles per day.</p>	Grades 3b agricultural land. Agricultural land holdings: Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly).	Low	Community land and assets where there is a combination of the following: <ul style="list-style-type: none"> • No or limited severance or accessibility issues; • Alternative facilities are available within the same community; • The level of use is very infrequent (a few occasions yearly); and • The land and assets are used by the minority ($>=50\%$) of the community. <p>Walkers, cyclists, horse riders: N/A</p>	Previously developed land with little potential to return to agriculture. Agricultural land holdings: Areas of land which are infrequently used on a non-commercial basis.

2.5.4 The significance of the effect upon land use, agriculture and socio-economics 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 2.5. Where a range of significance of effect is presented in Table 2.5, the final assessment for each effect is based upon expert judgement.

Table 2.5: Matrix used for the assessment of the significance of an effect.

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

2.5.5 A description of the significance levels is provided in the bullets below:

- Substantial: Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
- Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
- Moderate: These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

2.6 Maximum design envelope parameters for assessment

2.6.1 The maximum design envelope parameters identified in Table 2.6 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.

2.7 Impacts scoped out of the assessment

2.7.1 The impacts listed in Table 2.7 have been scoped out of the assessment for Land Use, Agriculture and Socio-economics as agreed through the EIA scoping process detailed in Volume 2, Chapter 5: Scoping and Consultation.

Table 2.6: Maximum design envelope parameters assessed.

Potential impact	Maximum design scenario	Justification
Construction		
Permanent loss of Common Land	Up to 10.10 ha of Common Land within main development site (Zone A) permanently lost (the 'release land')	Maximum scenario based on limits of deviation for main development site in Walton Common.
Temporary loss of Common Land	Up to 0.08 ha of Common Land crossed by gas pipeline route within Zone D1, with access prevented during pipe construction for up to one month. Up to 0.25 ha of Common Land crossed at its junction with Cooper Shaw Road (highway verge) and also at Parsonage Common (agricultural grassland) just north of the railway line in Zone F1/F2, for access for the purpose of establishing the new area of common land and for habitat creation and enhancement. Neither area would be surfaced.	Maximum area of temporary land-take and construction duration, which would have the greatest impact on the Common Land and any rights associated with it.
Temporary loss of agricultural land	Gas pipeline construction affecting approximately 8 ha of agricultural land in Zones C and D2 Construction compound affecting up to approximately 2 ha of agricultural land in Zone C Construction period up to six years.	Maximum area of temporary land-take and construction duration would have greatest impact on agricultural land use.
Permanent loss of agricultural land	Main development site (Zone A) loss of agricultural land up to 20 ha in total. Above ground installation for NTS connection (Zone D3) and access road loss of agricultural land up to 0.4 ha in total. Permanent access road (within Zone C) loss of approximately 1.5 ha in total. Permanent access road (within Zone G) loss of approximately 1 ha in total.	Maximum area of permanent land-take and minimum depth of buried assets would have greatest impact on agricultural land use.
Permanent loss of access to sand and gravel deposits	Above ground installation for NTS connection (Zone D3) up to 0.25 ha in total.	Maximum area of permanent land-take would have greatest impact on recoverability of natural resources.
Temporary change to the visual and acoustic amenity of public rights of way and areas of common land during construction	Maximum design scenario for noise and visual impacts as defined in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration respectively.	The maximum design scenario parameters for visual and noise impacts have been specified for those assessments.
Temporary stopping up or diversion of public rights of way	Temporary stopping up of a short length of the northern section of public footpath FP200 west of Buckland (with temporary diversion route to Station Road) for up to one month while gas pipeline crossing footpath is constructed.	Maximum extent and duration of temporary impacts on public rights of way.
Management measures for PRoW or other linear recreational routes	Management measures employed where the Thames Estuary Path and National Cycle Route (NCR) 13 are crossed during the construction of the causeway and delivery of Abnormal Indivisible Loads (AILs) in Zone G would include fencing and safety signage for the duration of the works as specified in Volume 3, Chapter 17: Marine Environment and use of banksmen to manage vehicles at the crossing when in use.	Maximum extent and duration of temporary impacts on public rights of way or other linear recreational routes.

Impact on employment and income due to construction workforce and investment	Construction workforce averaging 250 FTE and peaking at 350 FTE during up to 24 months in a single phase.	Reasonable maximum intensity of employment generation predicted by the applicant.
Operation and maintenance		
Disturbance to public rights of way users due to operational activity	Maximum design scenario for noise and visual impacts as defined in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration respectively	The maximum design scenario parameters for visual and noise impacts have been specified for those assessments.
Decommissioning		
Permanent loss of agricultural	Ongoing operation of all or part of flexible generation plant after 35 years with no restoration of previous land-uses.	Greatest long-term impact.

Table 2.7: Impacts scoped out of the assessment.

Potential impact	Justification
Operation and maintenance	
Employment generation	The facility is expected to have a small full-time workforce on site during operation. It would be operated by around six full-time equivalent (FTE) employees. In addition, approximately one major maintenance period (duration three weeks) and four minor maintenance visits (duration one week each) are expected per annum, estimated to require up to 20 and six staff daily respectively. It is not considered that these activities would result in a significant effect on the generation of employment opportunities or the labour market profile in Thurrock.
Impacts on recreational resources	After the completion of the pre-construction and construction activities there would be no further impacts on areas of common land, to which there is a right of public access on foot, and no impacts on other outdoor recreational resources such as PRoW.
Decommissioning	
Impacts on recreational resources	It is considered unlikely that there would be any significant impacts on recreational resources during decommissioning. The main development site would no longer be registered common land and no PRoW are likely to be impacted by temporary access routes to and from the site.
Impacts on agricultural resources	It is considered unlikely that there would be any further significant impacts on agricultural resources during decommissioning. It is assumed that the loss of agricultural land quality and land from the farm holding would remain as assessed during the construction phase of the proposed development.

2.8 Measures adopted as part of Thurrock Flexible Generation Plant

- 2.8.1 A number of measures have been designed in to the Flexible Generation Plant to reduce the potential for impacts on Land Use, Agriculture and Socio-economics. These are listed in Table 2.8.

Table 2.8: Designed-in measures.

Measures adopted as part of Thurrock Flexible Generation Plant	Justification
Construction phase	
A short length of the northern section of public footpath FP200 will be temporarily diverted for up to one month whilst the gas pipeline that crosses this section of footpath is constructed. The diversion will run from Station Road to join the remaining length of FP200 to the south (Zone J).	To maintain public access along public footpath FP200. This measure has been agreed with the Public Rights of Way officer at Thurrock Council.
To manage the interface of pedestrians/cyclists and construction traffic, measures (e.g. fencing, safety signage and use of a banksman) will be provided at the crossing of the Thames Estuary Path (FP146) and NCR13 during the construction of causeway and delivery of AILs.	To maintain safe public access along the Thames Estuary Path and NCR13 during construction and delivery of AILs.
A Soil Management Strategy will be developed post consent and implemented during construction.	To provide suitable detailed soil handling guidance that can be implemented effectively on site
Operation and maintenance phase	
Common land will be provided in Zone E to replace the common land lost in Zone A.	As required under the provisions set out in Section 16 of The Commons Act 2006.
The area of replacement common land within Zone E will exceed that lost in Zone A.	To provide additional benefit to the Common as required in Section 38 of the Commons Act 2006.
A new permissive access route for pedestrians will be provided to link Zone E to Fort Road, which will provide direct access to the area of replacement common land from Tilbury.	To provide direct access to the area of replacement common land from Tilbury.

3. Baseline environment

3.1 Soils and Agricultural Land Quality

3.1.1 The following describes the geology, soils and Agricultural Land Classification (ALC) of various development zones that affect agricultural land.

Geology

3.1.2 Most of these development zones are underlain by a thick deposit of estuarine alluvium, mostly of a very clayey texture and at height of about 2 m above Ordnance Datum (AOD). The only exceptions are Zones D, E and the northern part of Zone H, which are on slightly higher ground (up to about 15 m AOD) on river terrace sands and gravels, with a narrow strip of re-worked material referred to as "Head".

Soils

3.1.3 There is no detailed soil map for the area and so the only published source of information is Sheet 4 (Eastern England) of the 1:250,000 scale National Soil Map. This shows geographic groupings of soils called Soil Associations, usually related to specific parent materials as indicated in Table 3.1 and Table 3.2 below for those encountered at Tilbury. Within each Association there are likely to be a number of more tightly defined soil types known as Soil Series. The commonest one gives its name to the Association.

Table 3.1: Soil Types in the Development Zones A to E.

Site Reference	A	C	D 2-3	E
Geological Parent Material	Alluvium	Alluvium	Sand & gravel, some reworked as "Head"	Alluvium
Soil Association	813f WALLASEA 1	813f WALLASEA 1	571w Hucklesbrook	813f WALLESEA 1
Main Soil Characteristics	Poorly drained, very clayey soils	Poorly drained, very clayey soils	Well drained, light textured, stony soils	Poorly drained, very clayey soils
Published Provisional ALC	3	3	2	3
Revised ALC	3b	3b	2 and 3a	3b
Main Limitations	Wetness; heavy texture	Wetness; heavy texture	Droughtiness	Wetness; heavy texture

Table 3.2: Soil Types in the Development Zones F

Site Reference	F1-3	G
Geological Parent Material	Alluvium	Alluvium
Soil Association	813f WALLASEA 1	813f WALLASEA 1
Main Soil Characteristics	Poorly drained, very clayey soils	Poorly drained, very clayey soils
Published Provisional ALC	3	3
Revised ALC	3b	3b
Main Limitations	Wetness; heavy texture	Wetness; heavy texture

3.1.4 The WALLASEA 1 Association (813f) is described in the published information as a collection of "Deep, stoneless non-calcareous and calcareous clayey soils; soils locally have humose or peaty surface horizons; groundwater controlled by ditches and pumps, flat land, slight risk of flooding". The commonest soil is the Wallasea series per se, a non-calcareous clay, with random small areas of its calcareous analogue, the Newchurch series. The humose and peaty ones are Downholland series. Without a detailed site inspection, it is impossible to predict the extent, if any, of the Newchurch or Downholland soils. However, more detailed site inspections of the WALLASEA 1 Association (813f) on the Kent side of the Thames Estuary have shown that Wallasea soils per se are by far the dominant soil type present and effectively determine the ALC (see below).

3.1.5 Wallasea series soils have a very dark greyish-brown, clay topsoil. This overlies a clay subsoil which is usually greyish-brown with ochreous and grey mottles immediately below the topsoil, but which becomes grey with ochreous and reddish brown mottles at depth. The subsoil is usually plastic, verging on semi-fluid at depth. The mottling throughout the subsoil and the plastic to semi-fluid nature of the soils at depth is indicative of poor drainage. This is caused both by the clayey nature of the soils and the high water table. Newchurch soils are similar but contain small amounts of calcium carbonate, at least in the subsoil, while Downholland soils have a very dark brown or black humose or peaty topsoil.

- 3.1.6 All these soils are poorly drained and in their unimproved condition are in Wetness Class IV on a scale ranging from I (freely drained) to VI (effectively a swamp). It has been assumed that where the land use within any of the development zones is non-arable, then significant drainage improvements have not been carried out. Thus, they remain in Wetness Class 4 and are likely to remain so. Where they are in arable use, however, it is reasonable to assume that drainage improvements, probably including the installation of underdrainage, have been carried out and the soils are now in Wetness Class III.
- 3.1.7 The areas underlain by sand and gravel (development Zone D3 and eastern part of D2) are shown on the National Soil Map as Association 571w Hucklesbrook. This is a more variable association than the WALLASEA 1 Association, and is described as a collection of mainly "well drained coarse loamy and some sandy soils, commonly over gravel" associated with "some similar permeable soils affected by groundwater".
- 3.1.8 In this description the term "coarse loamy" denotes medium to light textures such as sandy loam or sandy silt loam and typical soils in this Association consist of variably stony, sandy loam topsoils and upper subsoils, passing down into more sandy (loamy sand and sand) lower subsoils then to gravelly material sometimes with a more clayey zone at the junction of the soil and the gravel. Hucklesbrook series have gravel at moderate depth while the Maplestead series soils are deeper. Sandier soils, with loamy sand topsoils over loamy sand or sand subsoils, are placed in the Ebstree series. All three of these soils are well drained (Wetness Class I) because of the permeable underlying gravels. However, in a few places, such as in small depressions and on the terrace margins adjacent to the river alluvium, the soils may be affected by groundwater and belong to the Breamore series which has distinct ochreous and grey mottled subsoils.

Published Agricultural Land Classification

- 3.1.9 The site appears on Sheets 161 (London NE) and 171 (London SE) of the 1:63,360 scale provisional ALC maps published in the early 1970s. These show the alluvial coastal marshes along the Thames Estuary as either undifferentiated Grade 3 or Grade 4, apparently depending on the degree to which their drainage has or has not been improved.
- 3.1.10 Development Zones A, C, E, F and western end of D2 are shown as Grade 3 land.

3.1.11 The Report to Accompany Sheet 161 specifically mentions the Tilbury Marshes as "mainly under grass, but cereals are grown where drainage has been improved". It offers no opinion as where within the Grade such land might be placed, but probably Subgrade 3c in the tri-partite division of Grade 3 then in use. Some areas of marshland Association 814f on the Essex side of the estuary and virtually all those on the Kent side are, however, shown as Grade 4 probably as a result of a subjective assessment of the poorer drainage conditions in mainly grassland areas than where arable cropping, as on the Tilbury Marshes, was being practiced.

3.1.12 Development Zones D3 and eastern part of D2 are shown on the published provisional 1:63 360 ALC maps as part of a belt of Grade 2 associated with river terrace sands and gravels between Grays and Stanford-le-Hope, with their main limitation being summer droughtiness.

Revised ALC

- 3.1.13 Since the publication of the 1:63,360 ALC maps there has been a major revision to the ALC system in 1988, with more emphasis on soil-climate interactions. The application of the revised system ideally requires detailed soil information from an on-site survey, but a reasonable prediction can be made using typical soil profiles of the main soils likely to be present as described above.
- 3.1.14 The revised system also requires detailed climatic information for typical points on the areas being studied, and the data for a series of representative locations provided in Table 3.3 below:

Table 3.3: Climatic Data for Agricultural Land Classification.

Reference Point	TQ 663766	TQ 666772	TQ 676777	TQ 678773	TQ 681775	TQ 656767	TQ 662772
Altitude (m)	2	2	9	14	14	2	2
Accumulated Temperature ATO (day degrees)	1498	1497	1490	1483	1483	1497	1497
Average Annual Rainfall AAR (mm)	559	555	557	563	562	555	555
Maximum Climatic Grade	1	1	1	1	1	1	1
Field Capacity Duration (days)	103	102	103	104	104	102	102

Reference Point	TQ 663766	TQ 666772	TQ 676777	TQ 678773	TQ 681775	TQ 656767	TQ 662772
Moisture Deficit for wheat (mm)	128	128	128	127	127	128	128
Moisture Deficit for potatoes (mm)	127	127	126	125	125	127	127

3.2 Agricultural Land Classification – Detailed Survey Results

- 3.2.1 A site inspection of Development Areas D3 and the eastern part of D2, overlying Terrace Gravels and Head, and areas A, C E and G on Estuarine Alluvium has been undertaken.
- 3.2.2 The distribution of ALC grades across the site, as identified from the detailed ALC survey work are shown on Figure 3.1 to Figure 3.3.
- 3.2.3 , with the Auger Boring Descriptions included as Volume 6, Appendix 8.1: Published ALC Information and ALC Site Survey Results. The soils at the eastern end of D2 were found to be generally well drained (Wetness Class I), light textured and with stony profiles over gravelly material at depths of between about 45 and 65 cm from the surface. Occasional profiles are encountered where the gravelly material is more than 90 cm from the surface, especially where there may have been accumulation of downwash on footslopes or in small depressions. The profiles in this area are limited due to the combination of the sandy textures and presence of gravelly material to Subgrade 3a according to a droughtiness limitation.
- 3.2.4 On the area of D3 and surrounding land, the soils generally consist of a dark brown, slightly stony medium sandy loam topsoil over a brown, similarly textured and usually slightly stony subsoil. In some profiles this becomes more sandy and then passes into impenetrably stony (gravelly) material at between about 45 to 55 cm from the surface. These profiles are more severely limited by droughtiness to Subgrade 3b due to the presence of gravelly material at a shallower depth.

3.2.5 In the remaining areas where agricultural land would be affected temporarily or permanently as part of the proposed development, the soils are poorly drained clays (Wetness Class III). Soil profiles commonly comprise approximately 20 cm clay topsoil overlying a thin mottled, dark grey mottled clay upper subsoil and a grey slowly permeable clay lower subsoil at a depth of approximately 30 cm. These profiles are limited to lower quality Subgrade 3b according to a moderately severe soil wetness limitation.

3.3 Farm Holdings

- 3.3.1 The distribution of agricultural land use within the Thurrock Local Authority area within which the proposed development study area is located, as well for the Eastern Region and England as a whole are summarised below in Table 3.4:

Table 3.4: Defra 2013-2016 Statistics for Breakdown on Key Crop Areas.

Location	Number of Holdings	Cereals (ha)	% Cereals	Fruit and Veg (ha)	%Fruit and Veg	Grassland (ha)	% Grassland
Thurrock LPA	53	2,718	64	0	0	1,524	36
Eastern Region	12,051	668,119	73	31,288	3	216,789	24
England	106,853	2,616,937	37	124,913	2	4,387,975	61

3.3.2 The statistical information identifies that the limited number of holdings within Thurrock are mainly characterised by cereal cropping (64%). This is slightly lower than the Eastern Region but is much higher than the average for England which is dominated by grassland agricultural use (61%).

3.3.3 The land affected by the proposed development forms part of two large arable-based family holdings based at Mill House Farm and Goshems Farm. The main holding affected at Mill House Farm comprises approximately 1,200 ha of land all held within the ownership of the family. The farm does comprise areas of common land affected by the proposed development as described in Paragraphs 3.3.1 to 3.3.3 below. None of the land affected by the proposed development within the holdings is part of an agri-environment scheme and no farm buildings are affected by the proposals.

3.4 Other Land Uses

Minerals

3.4.1 There are no extant mineral operations within the study area. The current development plan for Thurrock does not identify any areas to be safeguarded for minerals. Under Policy CSTP32 it states that mineral safeguarding areas will be identified in the forthcoming Thurrock Local Plan, which is expected to be adopted in late 2020. On the basis of this current policy position, it is not possible to undertake an assessment of potential effects on mineral resources.

Access Land

3.4.2 The following areas of registered common land, which forms part of The Green, Hall Hill, Fort Road, Parsonage, Walton and Tilbury Fort Commons (Common Land Parcel CL228), lie within the study area:

- Parsonage Common, comprising agricultural grassland which is accessed directly from Cooper Shaw Road; and
- Walton Common, comprising agricultural grassland which is accessed via a strip of registered common land (which forms part of CL228) from Parsonage Common to the north via an at grade crossing over the railway line. There is little evidence of access by the public on Walton Common, which may be a result of the need to cross the railway, as well as two padlocked gates on either side of the railway line.

3.4.3 To the north-east of Walton Common a small strip of common land known as Tilbury Green (Common Land Parcel CL411) runs from Station Road along the alignment of the northern section of public footpath FP200.

3.4.4 In addition to the grazing rights described above, these areas of registered common land are designated as Access Land under the provisions of the Countryside and Rights of Way Act 2000. This legislation provides a right of public access on foot for the purposes of open-air recreation to areas of Access Land.

Public Rights of Way

3.4.5 To the south of the main development site (Zone A), the Thames Estuary Path runs along the northern shore of the River Thames (within Zone G) along the alignment of public footpath FP146. It is a 46 km route between Tilbury Town and Leigh-on-Sea. Natural England has begun to investigate how to improve coastal access along this stretch of the Essex coast, with new access proposals expected to be finalised and published in Spring 2020.

3.4.6 The only other PRoW within the study area is public footpath FP200, a small length of the northern section of which is crossed by the corridor for the potential gas pipeline route in Zone D1. The access to FP200 from Station Road is heavily overgrown making walking from this direction difficult.

3.4.7 There is the potential for a new public right of way to be provided as part of the restoration works at Ash Fields South to the south-east of the site. The Initial Restoration Plan for the planning permission for Ash Fields (Application Ref: 17/00412/FUL) includes an indicative alignment for this new route, the aspiration for which is to provide a link between the existing Two Forts Way riverside path (the Thames Estuary Path) and Walton and Parsonage Commons, with onward links via Cooper Shaw Road to public footpaths to West Tilbury.

Cycle Routes

3.4.8 National Cycle Route (NCR) 13 runs along the northern shore of the Thames along the same alignment as the Thames Estuary Path (FP146) within Zone G. NCR13 is a 238.5km route between Tower Bridge in London to Fakenham in Norfolk. In this location the route is traffic-free along a surfaced track.

Visitor attractions

3.4.9 There are no visitor attractions located within the study area. Those nearest to the proposed development comprise:

- Tilbury Fort which is located approximately 1.5km to the south-west of the main development site. This is a bastioned 17th century artillery fortress with a museum, exhibition and gift shop. Vehicular access to Tilbury Fort is via Fort Road, with cycle access via NCR 13 and pedestrian access via the Thames Estuary Path running along the alignment of public footpath FP146.
- Coalhouse Fort which is located approximately 2.8km to the east of the main Thurrock Flexible Generation Plant development site, which was constructed between 1861 and 1874 and is set within several acres of parkland next to the River Thames. Coalhouse served as a coastal defence battery during WW1 and WW2 and is currently undergoing refurbishment. Open days and guided tours are available throughout the year. It can also be accessed on foot and by cycle along the Thames Estuary Path and NCR13.



Figure 3.1: Auger Boring and Agricultural Land Classification Plan (Sheet 1)

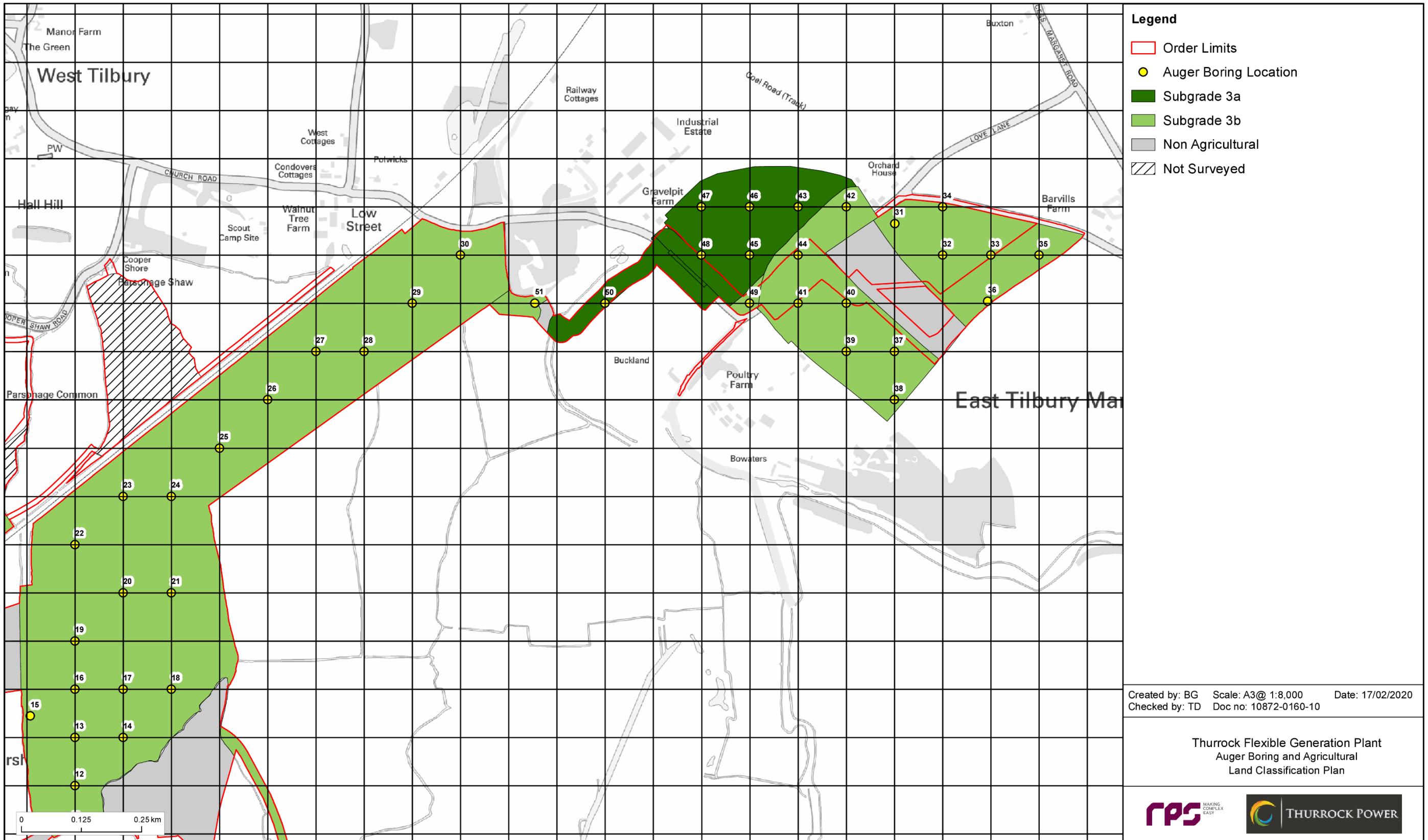


Figure 3.2: Auger Boring and Agricultural Land Classification Plan (Sheet 2)

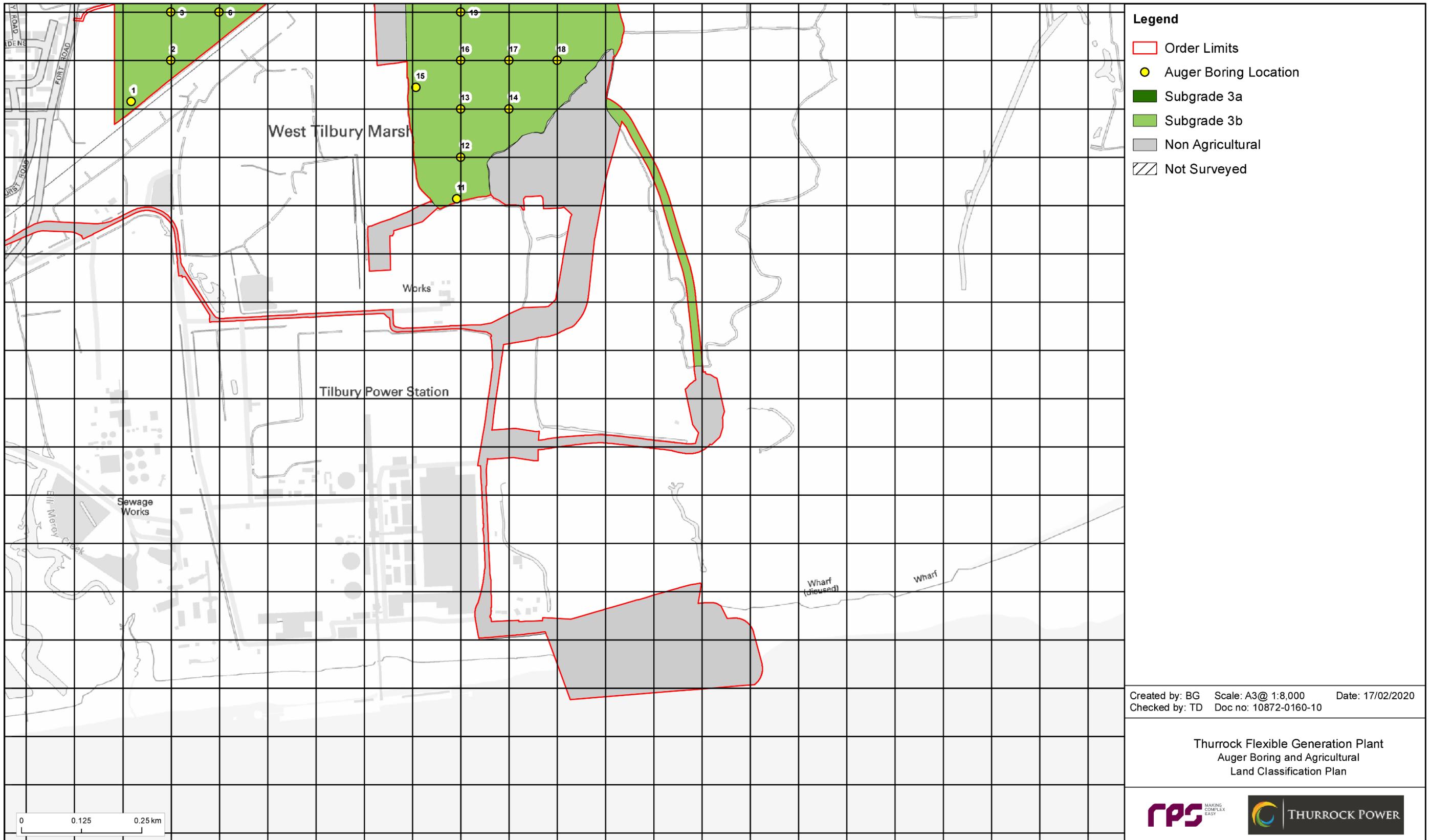


Figure 3.3: Auger Boring and Agricultural Land Classification Plan (Sheet 3)

3.5 Socio-Economics

Resident Population

3.5.1 Official labour market statistics provided by NOMIS (ONS) show that the resident population of Thurrock totalled 172,500 in 2019, split almost equally between males (85,200) and females (87,400).

Employment

3.5.2 Of the resident population in 2018, there were 108,900 in the 16-64 age category, 89,700 (48,400 males and 41,300 females) of whom are categorised as being ‘economically active’ i.e. people who are either in employment or unemployed. The unemployed as a percentage of the economically active population in the year up to March 2019 was 4.0%, which is higher than the wider Eastern region (3.4%) but slightly lower to Great Britain as a whole (4.1%).

Qualifications

3.5.3 Table 3.5 shows the skills levels for the population within the study area in 2019:

Table 3.5: Qualification Levels of the Study Area Population 2018.

Individual Level	Thurrock %	East of England %	Great Britain %
NVQ4 and above	25.9	35.2	39.3
NVQ3 and above	341.5	53.1	57.8
NVQ2 and above	62.4	72.8	74.9
NVQ1 and above	77.5	86.0	85.4
Other Qualifications	10.4	6.5	6.8
No Qualifications	12.2	7.4	7.8

3.5.4 Table 3.5 shows significantly lower proportions of the population educated to National Vocational Qualification (NVQ) levels 4 across the socio-economic study area in comparison with the East of England and Great Britain. At the other end of the spectrum, the socio-economic study area has a higher proportion of the population with no qualifications than the East of England and a lower proportion than Great Britain as a whole.

Occupation

- 3.5.5 Table 3.6 shows employment by occupation, based on the following Standard Occupation Classifications (SOC):
1. Managers, directors and senior officials;
 2. Professional occupations;
 3. Associate professional and technical;
 4. Administrative and secretarial;
 5. Skilled trades occupations;
 6. Caring, leisure and other service occupations;
 7. Sales and customer service occupations;
 8. Process plant and machine operatives; and
 9. Elementary occupations.

Table 3.6: Employment by Occupation (April 2019-March 2019).

SOC Major Group	Thurrock %	East of England %	Great Britain %
Major Groups 1-3	36.7	46.5	46.8
1	8.9	11.9	10.9
2	15.0	19.9	20.9
3	12.5	14.6	14.8
Major Groups 4-5	26.9	21.1	20.1
4	14.9	10.6	9.9
5	11.9	10.5	10.1
Major Groups 6-7	16.8	16.2	16.5
6	6.9	9.3	9.0
7	9.8	6.9	7.4
Major Groups 8-9	19.6	16.1	16.6
8	10.0	6.2	6.3
9	9.4	9.9	10.3

3.5.6 Table 3.6 shows that socio-economic study area has significantly lower proportions of the working population engaged in SOC Groups 1 to 3 than the East of England and Great Britain. With SOC Groups 4 to 5, the socio-economic study area has a slightly higher proportion of the working population than the region and Great Britain. For SOC Groups 6 to 7 the proportion is more closely aligned with the region and Great Britain. For SOC groups 8 to 9, the socio-economic study area has higher proportions of the population in these occupations than the East of England and Great Britain.

Industry

3.5.7 Table 3.7 sets out existing employee jobs by industry.

Table 3.7: Employee Jobs by Industry 2017.

SOC Major Group	Thurrock %	East of England %	Great Britain %
Mining and quarrying (B)	0.0	0.1	0.2
Manufacturing (C)	5.5	8.0	8.2
Electricity, gas, steam and air conditioning supply (D)	0.3	0.3	0.5
Water supply; sewerage, waste management and remediation activities (E)	1.1	0.6	0.7
Construction (F)	6.2	5.5	4.8
Wholesale and retail trade; repair of motor vehicles and motorcycles (G)	26.6	17.1	15.2
Transportation and storage (H)	15.6	4.9	4.7
Accommodation and food service activities (I)	6.2	6.8	7.5
Information and communication (J)	1.6	3.6	4.4
Financial and insurance activities (K)	0.9	2.4	3.5
Real estate activities (L)	0.8	1.5	1.7
Professional, scientific and technical activities (M)	3.9	9.3	8.4
Administrative and support service activities (N)	7.8	10.5	9.1
Public administration and defence; compulsory social security (O)	2.3	3.0	4.3
Education (P)	9.4	8.8	8.9
Human health and social work activities (Q)	9.4	12.6	13.3
Arts, entertainment and recreation (R)	1.6	2.7	2.6
Other service activities (S)	1.4	1.9	2.0

3.5.8 Table 3.7 shows that the study area is quite closely aligned with the South East of England and Great Britain in most categories, with notable exceptions being a higher proportion working with the wholesale and retail trade; repair of motor vehicles and motorcycles (G) and transportation and storage (H) sectors, and lower proportions in the information and communication (J) and professional, scientific and technical activities (M) sectors.

Deprivation

3.5.9 Since the 1970s, the Ministry of Housing, Communities and Local Government and its predecessors have calculated local measures of deprivation in England. The English Indices of Deprivation 2015 (DCLG, 2015) are based on 37 separate indicators, organised across seven distinct domains of deprivation which are combined, using appropriate weights, to calculate the Index of Multiple Deprivation (IMD). In 2015 Thurrock was ranked 111th most deprived out of 326 local authority areas (1st being most deprived).

Economy

3.5.10 The overall aim of Thurrock's Economic Growth Strategy (2016-2021) is to “provide a basis for securing investment and economic diversification, including the identification of new and exciting opportunities for Thurrock”. In relation to Tilbury, this includes:

“Regeneration of Tilbury’s town centre and Civic Square through growth of primary care facilities and wider business opportunities such as port expansion to reduce levels of inequality and support job creation. Expansion of the Port of Tilbury through the development of London Distribution Park is key to growing the port’s already successful distribution capability and securing Tilbury as the leading logistics and distribution hub”.

3.5.11 It also describes the presence of existing business activities covering environment, energy and recycling and highlights the opportunity to grow employment in these sectors on a limited basis in the short to medium term.

3.5.12 Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy. GVA data is not available at the district level from the ONS. Thurrock, however, is part of the South East Local Enterprise Partnership (LEP). GVA per head is calculated as economic activity in a region divided by the number of people living there. GVA per head in the South East LEP was 81.9 (with the average being 96.30).

3.6 Future baseline

Agricultural Land Classification

- 3.6.1 The Met Office Hadley Centre (MOHC) UK Carbon Projections ('UKCP18') dataset (MOHC, 2018) provides probabilistic projections of change in climatic parameters over time for 25 km grid squares across the UK. Projected changes for a RCP8.5¹ future global greenhouse gas emissions scenario have been reviewed for the 2050–2069 and 2080–2099 periods, representing changes towards the end of the proposed development's initial 35-year operating lifetime and changes for the period beyond that should operation continue.
- 3.6.2 Research prepared for DEFRA and the Welsh Government in 2014 considered the impact of climate change on the capability of land for agriculture as defined by the ALC (Keay et al., 2014).
- 3.6.3 Based on this, DEFRA produced a Policy Brief SP1104 (DEFRA, 2015) that summarises the potential impact.
- 3.6.4 For sites which are affected by soil wetness, the brief concluded that the quality of the land would be "*Largely unaffected over most of England and Wales mainly because, even though the start and end dates of field capacity are likely to change, the duration remained constant*".
- 3.6.5 Where droughtiness is the main limitation, the retention of high quality land would be likely to become more dependent on the use of irrigation to maintain productivity and versatility in agricultural land use.
- 3.6.6 Overall the Policy Brief concludes that "*the findings of this project to not undermine the current use of the ALC system within land use planning*".
- 3.6.7 For the majority of the land affected by Thurrock Flexible Generation Plant therefore, where soil wetness is the main limiting factor, the quality of the land would, based on this recent research, be unlikely to be significantly affected by climate change.

3.6.8 For the small areas of the best and most versatile land affected by Thurrock Flexible Generation Plant, where the main limiting factor is soil droughtiness, there may be a small reduction in the quality of the land due to the increasing soil moisture deficit. However, it is considered that whilst some of the Grade 2 land might become marginal 2/3a, that this would not remove this land from the overall classification of best and most versatile.

Other Land Uses

- 3.6.9 No changes to the baseline of other land use resources likely to be affected by the Thurrock Flexible Generation Plant are anticipated.

Socio-economics

- 3.6.10 There is the potential for the socio-economic baseline environment to change in Thurrock in general and Tilbury in particular as a result of initiatives that are proposed by Thurrock Council in planning and economic policy documentation. However, this is unlikely to result in any material changes to the assessment of effects on socio-economic receptors arising from the proposed Thurrock Flexible Generation Plant which are set out in this chapter of the ES.

- 3.6.11 The 2016-based ONS Subnational Population Projections for England (ONS, 2018) state that the East of England population is projected to grow by 15.3% between 2016 and 2041, which is greater than the rate for England as a whole (12.1%).

¹ RCP8.5 refers to a high-emissions scenario assuming 'business as usual' growth globally with little additional mitigation. This is a conservative (worst-case) approach for the assessment

4. Assessment of Effects

4.1 Construction phase

Impacts of construction on Agricultural Land Classification and Farm Holdings

Magnitude of impact – Agricultural Land Classification

- 4.1.1 There would be a permanent loss of agricultural land in the following areas at the beginning of the construction period, based on identified parameters Thurrock Flexible Generation Plant in Table 4.1.

Table 4.1: Permanent loss of Agricultural Land.

Zone	Area	Land Use	Agricultural Land Quality
A	18.5 ha	Flexible Generation Plant	Grade 3b
C	Approximately 1.5 ha	Permanent access	3b
D3	0.4 ha	Above ground gas connection compound	3b
G	1.0ha	Permanent access	3b

- 4.1.2 The “no-dig” zone has been included within the assessment, although normal agricultural activities would be able to continue, with appropriate precautions, above the pipeline.
- 4.1.3 The land permanently affected comprises lower quality Subgrade 3b or 4 land associated with the presence of the Wallesea Soil Association and the stony and sandy drought prone soils in Zone D3
- 4.1.4 In addition, there would be a number of temporary effects on agricultural land during the construction period, shown in Table 4.2.

Table 4.2: Temporary Effects on Agricultural Land.

Zone	Area	Land Use	Agricultural Land Quality
C	Approximately 2.8 ha	Gas pipeline route	3b/4

Zone	Area	Land Use	Agricultural Land Quality
D2	Approximately 5.2 ha	Gas pipeline installation (assume 3000 m long x 20 m width)	3a/3b
C	Approximately 2 ha	Maximum laydown area	3b

4.1.5 The majority of the land temporarily affected during construction is likely to comprise lower quality Subgrade 3b or 4 land associated with the presence of the Wallasea Soil Association. A total of 1.8 ha of higher quality Subgrade 3a best and most versatile land would be likely to be affected in Zone D.

4.1.6 The magnitude of the impact on agricultural land quality is assessed as **major** during the construction phase, based on the combined total permanent and temporary effects on the agricultural land.

4.1.7 However, the implementation of the measures adopted as part of Thurrock Flexible Generation Plant would ensure that the soils and agricultural land quality would be restored at the end of the construction period to reduce, as far as possible, any permanent effects on the best and most versatile agricultural land.

4.1.8 The permanent loss of the lower quality land would therefore affect a moderate magnitude of lower quality Subgrades 3b land of medium sensitivity. This loss is assessed to be on Moderate Adverse significance but does not represent a significant effect as it affects none of the best and most versatile agricultural land, referred to in the NPPF and falls outside of the requirement for formal consultation with Natural England where areas of greater than 20ha of the best and most versatile land are affected.

Sensitivity of receptor – Agricultural Land Classification

4.1.9 The sensitivity of the receptor is assessed to be **medium to high** based on the presence of areas of predominately lower quality Subgrade 3b with a small area of 1.8ha Subgrade 3a agricultural land.

Significance of the effect – Agricultural Land Classification

4.1.10 The temporary effect on Agricultural Land Classification is assessed to be **moderate** adverse. This does not represent a significant effect as it affects none of the best and most versatile agricultural land, referred to in the NPPF and falls outside of the requirement for formal consultation with Natural England where areas of greater than 20 ha of the best and most versatile land are affected.

Further mitigation or enhancement – Agricultural Land Classification		Impacts of construction on Common Land
4.1.11	No further mitigation or enhancement measures are considered to be required.	4.1.18 The main development site (Zone A) where the gas fired facility, battery storage area and customer substation will be located partly comprises an area of common land known as Walton Common. The maximum area of the Common that will be affected is 10.10 ha and it is the only area of common land that will be permanently affected by the Thurrock Flexible Generation Plant. The land is also designated as Access Land under the Countryside and Rights of Way Act 2000, to which there is a right of public access on foot, Walton Common comprises relatively flat permanent grassland to which grazing rights are also attached, as described above.
	Residual effect – Agricultural Land Classification	
4.1.12	The residual effect following no further mitigation or enhancement is predicted to remain moderate adverse which does not represent a significant effect as it affects none of the best and most versatile agricultural land, referred to in the NPPF and falls outside of the requirement for formal consultation with Natural England where areas of greater than 20ha of the best and most versatile land are affected.	4.1.19 A small area of 0.08 hectares of Tilbury Green common land in Zone D1 would be temporarily affected by works associated with the laying of the proposed gas pipeline. It is expected that trenchless construction for the pipeline would be employed at this location, minimising or avoiding direct physical impact to the common land, but it may be necessary to limit access for the duration of the works (less than one month) for safety. It is proposed that this temporary effect would be included in a Section 38 application under the Commons Act 2006. On completion of the works an easement would be obtained for future access to and maintenance of the pipeline but there would be no continuing impact of this area of common.
	Magnitude of impact – Farm Holdings	
4.1.13	There would be a permanent loss of approximately 20.4 ha of land within the zones shown in Table 4.1 above at the beginning of construction together with temporary effects on approximately 10ha of agricultural land within the zones as shown in Table 4.2 above. There would be a permanent loss of approximately 21 ha from Mill House Farm and approximately 0.4 ha from the second large arable holding based at Goshems Farm. Approximately 5.5 ha of land would be taken temporarily from Mill House Farm holding during construction and approximately 4.5 ha from the Goshems Farm holdings. The loss of both temporary and permanent areas from two large arable land holdings would represent a negligible magnitude of change to these holdings.	4.1.20 Access to Zones E and F by agricultural machinery for the purpose of establishing the new area of common land and for habitat creation and enhancement would cross a small area of common land at its junction with Cooper Shaw Road (highway verge) and also cross Parsonage Common (agricultural grassland) just north of the railway line. Neither of these access routes, totalling around 0.25 hectares, would be surfaced and grazing and public access would not be interrupted, with traffic management measures employed if and where necessary.
	Sensitivity of receptor – Farm Holdings	
4.1.14	The sensitivity of the receptor is assessed to be medium based on the presence of the arable based farming enterprise affected.	4.1.21 It would be necessary to provide exchange land for the loss of Walton Common of equal size and quality, as required under Section 16 of the Commons Act 2006 or Section 131 of the Planning Act 2008. It is proposed that Zone E, which comprises 11.6 ha of land, would be used for this purpose
	Significance of the effect – Farm Holdings	
4.1.15	The temporary effect on farm holdings is assessed to be negligible , which is not significant in EIA terms.	4.1.22 To mitigate for the loss of the registered common land in Zone A, and in recognition of the temporary disruption to rights of grazing and public access across the registered common land in Zone D1 and F1/F2, a new area of 'replacement' permanent registered common totalling 11.6 ha would be provided, in accordance with the provisions set out in Sections 16 and 38 of the Commons Act 2006 (and Section 131 of the Planning Act 2008). This would be located in Zone E and would be contiguous with the other parts of land which form part of The Green, Hall Hill, Fort Road, Parsonage and Walton Commons (Common Land Parcel CL CL228).
	Further mitigation or enhancement – Farm Holdings	
4.1.16	No further mitigation or enhancement measures are considered to be required.	
	Residual effect – Farm Holdings	
4.1.17	The residual effect following no further mitigation or enhancement is predicted to remain negligible , which is not significant in EIA terms.	

- 4.1.23 In addition to being of sufficient size, Zone E also comprises soils of a similar type to those found on Walton Common and is therefore considered to be of equivalent quality. The area is currently being cropped and would be established with a suitable grassland mix prior to works commencing on Zone A to achieve, as a minimum, grassland of the same quality as that existing in Zone A and to ensure that the rights of public access and grazing are able to commence prior to the start of construction works. This new area of replacement land, by virtue of its designation as registered common land, would also become Access Land under the provisions of the Countryside and Rights of Way Act 2000, with the same rights of public access.
- 4.1.24 In addition, an access point from Fort Road to the north-west corner of the exchange land would be provided. This would comprise a footbridge from the highway verge across the drainage ditch to the field and a fenced permissive path along the edge of the field to the exchange land in Zone E. The footbridge location would be opposite the existing area of common land along the north-eastern edge of West Tilbury and would connect with Fort Road Common, improving public access between West Tilbury and the various areas of Access Land, including Parsonage Common, for recreational use.
- 4.1.25 This route would also significantly reduce the walking distance to the area of replacement common land. Currently, Walton Common is accessed from Tilbury via common land along Fort Road, Cooper Shaw Road, Parsonage Common and the railway, a distance of over 2 km. By agreement with the landowner, the route from Fort Road to the exchange land would be a permissive footpath which would be secured through contractual agreement with the landowner.
- Magnitude of impact – Common Land**
- 4.1.26 The provision of 11.6 ha of 'replacement' land in Zone E which would become registered common land and, by virtue of its designation, Access Land, would mitigate for the permanent loss of 10.10 ha in Zone A and also the short-term temporary disruption of a maximum of 0.33 ha in Zone D1 and Zone F1/F2 during construction. It would also be contiguous with the remaining areas of The Green, Hall Hill, Fort Road, Parsonage and Walton Commons to the north and would be of a comparable nature and character to Walton Common. In addition, the creation of a new permissive footpath between Zone E and Fort Road would improve access on foot to the replacement common land and Parsonage Common to the north. The replacement common land, to which the same rights would be attached as those currently extant on Walton Common, would be available for use in advance of construction. Taking these factors into account the magnitude of the impact on Common Land is assessed to be **minor** beneficial.
- 4.1.27 Any potential impacts on the amenity of common land during construction are addressed in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration of this ES.
- Sensitivity of receptor – Common Land**
- 4.1.28 The area of Common Land that is affected by the proposed development is a national land resource that is protected by legislation but one which currently exhibits signs of limited use as a recreational resource. The sensitivity of this receptor is therefore assessed to be **medium**.
- Significance of effect – Common Land**
- 4.1.29 The significance of effect on Common Land during the construction stage of the proposed development is therefore assessed to be **minor** beneficial, which is not significant in EIA terms.
- Further mitigation or enhancement – Common Land**
- 4.1.30 No further mitigation or enhancement measures are considered to be required.
- Residual effect – Common Land**
- 4.1.31 The residual effect on common land, with no further mitigation or enhancement measures, is predicted to remain as **minor** beneficial, which is not significant in EIA terms.
- Impacts of construction on Public Rights of Way**
- 4.1.32 To the south of the main development site (Zone A), the Thames Estuary Path runs along the northern shore of the River Thames (within Zone G) along the alignment of public footpath FP146. The route of the Thames Estuary Path would remain along its current alignment throughout the construction of the causeway and access road for construction traffic, and during the delivery of abnormal indivisible loads. At these times appropriate measures would be put in place (e.g. fencing and safety signage and the use of a banksman) to manage the interface of pedestrians/cyclists and construction traffic. These measures are included in the Code of Construction Practice for the project (application document A8.6).
- 4.1.33 A temporary diversion of a short length of the northern section of public footpath FP200, the access to which off Station Road is currently very overgrown, may be required for up to one month while gas pipeline crossing footpath is constructed in Zone D1. The diversion, which would run from Station Road to join the remaining length of FP200 to the south, has been agreed with the Public Rights of Way officer at Thurrock Council.

- | | |
|--|---|
| <p>Magnitude of impact – Public Rights of Way</p> <p>4.1.34 During construction the Thames Estuary Path (along FP146) would remain along its current alignment with measures in place to manage the interface of construction traffic and pedestrians at the crossing point. Similar measures were observed during the site visit in summer 2019 along the Thames Estuary Path for the ongoing re-profiling and restoration works at Ash Fields, Tilbury Riverside. In relation to FP200, there would be a short-term accessible diversion that has been agreed with Thurrock Council. Taking these factors into account the magnitude of the impact on public rights of way is assessed to be minor adverse.</p> <p>4.1.35 Any potential impacts on the amenity of public rights of way during construction are addressed in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration of this ES.</p> <p>Sensitivity of receptor – Public Rights of Way</p> <p>4.1.36 The Thames Estuary Path is a well-used route promoted by Essex County Council and the sensitivity of this receptor is therefore assessed to be medium. The sensitivity of public footpath FP200, which is a local route, is assessed to be low.</p> <p>Significance of effect – Public Rights of Way</p> <p>4.1.37 The significance of effect on both the Thames Estuary Path and FP200 during the construction stage of the proposed development is therefore assessed to be minor adverse, which is not significant in EIA terms.</p> <p>Further mitigation or enhancement – Public Rights of Way</p> <p>4.1.38 No further mitigation or enhancement measures are considered to be required.</p> <p>Residual effect – Public Rights of Way</p> <p>4.1.39 The residual effect on public rights of way, with no further mitigation or enhancement measures, is predicted to remain as minor adverse, which is not significant in EIA terms.</p> <p>Impacts of construction on Cycle Routes</p> <p>4.1.40 National Cycle Route (NCR) 13 runs along a surfaced track on the northern shore of the Thames along the same alignment as the Thames Estuary Path (FP146) within Zone G.</p> | <p>Magnitude of impact – Cycle Routes</p> <p>4.1.41 The route of NCR13 would remain unchanged throughout the construction of the causeway and access road for construction traffic, and during the delivery of abnormal indivisible loads. At these times appropriate measures would be put in place for both the Thames Estuary Path and NCR13, comprising safety signage and the use of a banksman), to manage the interface of pedestrians/cyclists and construction traffic. These are included in the Code of Construction Practice for the project (application document A8.6). Similar measures were observed during the site visit in summer 2019 along the Thames Estuary Path in relation to restoration works at Ash Fields, Tilbury Riverside. Taking these factors into account the magnitude of the impact on cycle routes is assessed to be minor adverse.</p> <p>4.1.42 Any potential impacts on the amenity of cycle routes during construction are addressed in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration of this ES.</p> <p>Sensitivity of receptor – Cycle Routes</p> <p>4.1.43 NCR 13 is part of the National Cycle Network and is a nationally promoted route running from London to Norfolk which is well used. The sensitivity of this receptor is therefore assessed to be high.</p> <p>Significance of effect – Cycle Routes</p> <p>4.1.44 The significance of effect on NCR13 during the construction stage of the proposed development is therefore assessed to be minor adverse, which is not significant in EIA terms.</p> <p>Further mitigation or enhancement – Cycle Routes</p> <p>4.1.45 No further mitigation or enhancement measures are considered to be required.</p> <p>Residual effect – Cycle Routes</p> <p>4.1.46 The residual effect on cycle routes, with no further mitigation or enhancement measures, is predicted to remain as minor adverse, which is not significant in EIA terms.</p> |
|--|---|

- Impacts of construction on visitor attractions**
- 4.1.47 The nearest visitor attraction to the proposed Thurrock Flexible Generation Plant is the historic Tilbury Fort, which lies approximately 1.5 km to the south-west of the main development site (Zone A). There would be **no impact** on this resource during the construction phase. Any potential impacts on its amenity during construction are addressed in Volume 3, Chapter 6: Landscape and Visual Resources and Chapter 11: Noise and Vibration of this ES.
- Impacts of construction may affect socio-economic receptors**
- Magnitude of impact – Socio-economics**
- 4.1.48 As noted above, before a project has gone out to tender, it is not possible to know with certainty the level of employment that would be generated during the construction phase. However, it is possible to estimate the employment levels for a site, based on the total construction cost of a project, the build programme and the average turnover per UK construction worker per year. It is estimated by the Applicant that the construction workforce would average 250 FTE over a 24 month construction period. The levels of employment and the profile of skills will fluctuate, and it is estimated that it will peak at around 350 FTE during the construction period.
- 4.1.49 Through the consultation exercise, Essex County Council recommended that the applicant considers the employment generation through the construction phase. In particular consideration should be given to datasets to quantify potential construction employment effects through the Construction Industry Training Board Labour Forecasting Tool. The output of the use of the Forecasting Tool is set out in the report attached at Volume 6, Appendix 8.3: Construction Labour Forecasting. The Tool can be a more sophisticated method of labour forecasting than the method outlined above, but also has the limitation that it is based on industry averages, rather than taking into account a developer's experience of other similar projects.
- 4.1.50 The report estimates that the labour demand arising from the Thurrock Flexible Generation Plant construction, broken down into manual and non-manual occupations. During 2021 and 2022 the total labour demand predicted is 510 people. This is broken down into manual occupations at around 290 people (58%) and non-manual at around 210 people (42%).
- 4.1.51 The Tool is based on capital spend. The Flexible Generation Plant's capital-intensive items will be largely pre-manufactured offsite, so the onsite workforce for civils and assembly may be smaller than the capital spend might suggest (based on industry averages), hence the difference between the two estimates.
- 4.1.52 In addition to the direct construction employment generated by work on site, there would be an associated increase in local employment arising from the indirect and induced effects of the construction activity (known as 'multiplier effects'). Such effects would arise within the study area (and beyond) through manufacturing and service provision along the supply chain and through the expenditure of construction workers (on food, accommodation etc.). The Additionality Guide (Homes and Communities Agency, 2014) provides a series of multiplier values to calculate indirect and induced employment effects. Where there are average supply linkages (and the Additionality Guide acknowledges that the majority of interventions will be in this category), a multiplier of 1.1 can be used at the 'neighbourhood' or local level and 1.5 at the regional level. As a district sitting between the neighbourhood and regional levels, a multiplier of 1.3 for the study areas is reasonable for assessment purposes for the proposed development, resulting in a further 75 no. of temporary jobs over the construction period using the Applicant's estimation of construction jobs, or 153 using the CITB Forecasting Tool.
- 4.1.53 Construction companies tend to bring much of their labour force with them to undertake developments. Whilst a number of companies and contractors would be involved, it is unlikely that all of these companies would be based in the socio-economic study area. The Construction Industry Training Board (CITB) Workforce Mobility and Skills in the UK Construction Sector 2018-2019 South East Report (CITB, 2019) found that the mean distance from workers' homes to their current site was 27 miles in the East of England, or 18 miles on average across the UK as a whole.
- 4.1.54 A third (36%) travelled less than 10 miles from their current residence to the site they work, whilst 22% travelled between 10 and 19 miles, 31% travelled between 20 and 49 miles, 9% travelled between 50 and 99 miles and 2% travelled more than 100 miles. Given the mobility of the construction workforce in the region, and taking account of the relatively higher proportion of the study area and regional workforce engaged in the construction sector SOC F (see Table 3.7 above), it is not expected that there would be an impact, temporary or otherwise on the usual resident population of the study area. Local benefit will be maximised through appropriate training programmes for qualifying local workers.
- 4.1.55 Taking into account the levels of economically active people in the study area, it is considered that the proposed development would result in a **minor** beneficial magnitude of impact in relation to socio-economic baseline conditions.

Sensitivity of receptor – Socio-economics	Significance of effect – Agricultural Land Classification
4.1.56 The area considered by this assessment comprises the administrative area of Thurrock. Given the high level of unemployment in the area relative to the wider region, the sensitivity to socio-economic impacts is low to medium .	4.2.3 The effect of farm agricultural land classification is assessed to be of moderate adverse significance, which does not represent a significant effect as it affects none of the best and most versatile agricultural land, referred to in the NPPF and falls outside of the requirement for formal consultation with Natural England where areas of greater than 20ha of the best and most versatile land are affected.
Significance of effect – Socio-economics	Further mitigation or enhancement – Agricultural Land Classification
4.1.57 The significance of effects on socio-economic receptors during the construction phase is assessed to be minor to moderate beneficial, which is not significant in EIA terms.	4.2.4 No significant adverse effects have been predicted and no further mitigation is considered to be required.
Further mitigation or enhancement – Socio-economics	Residual effect – Agricultural Land Classification
4.1.58 No further mitigation or enhancement measures are considered to be required.	4.2.5 The residual effect following no further mitigation or enhancement is predicted to remain moderate adverse which is not significant in EIA terms.
Residual effect – Socio-economics	Magnitude of impact – Farm Holdings
4.1.59 The residual effect following no further mitigation or enhancement is predicted to remain minor to moderate beneficial, which is not significant in EIA terms.	4.2.6 The restoration of areas temporarily affected at the end of the construction period would enable this land to be returned to its former agricultural use. There would be a remaining permanent loss of approximately 21 ha from Mill House Farm and approximately 0.4 ha from the second large arable holding based at Goshems Farm. The magnitude of impact on these large arable farm holdings is assessed as negligible .
Future monitoring	Sensitivity of the receptor – Farm Holdings
4.1.60 No future monitoring in relation to agricultural resources, recreational or visitor resources or socio-economics is considered to be required.	4.2.7 The sensitivity of the receptor is assessed to be medium based on two large arable based holdings.
4.2 Operational and maintenance phase	Significance of effect – Farm Holdings
Impacts of operation and maintenance may affect Agricultural Land Classification and farm holdings	4.2.8 The effect of farm holdings is assessed to be of negligible significance, which is not significant in EIA terms.
Magnitude of impact – Agricultural Land Classification	Further mitigation or enhancement – Farm Holdings
4.2.1 The restoration of areas temporarily affected at the end of the construction period would enable this land to be returned to its former agricultural use. There would be a remaining permanent loss of approximately 21.4 ha of lower quality Subgrade 3b land. The magnitude of impact on agricultural land classification based on this loss is assessed as moderate .	4.2.9 No further mitigation or enhancement measures are considered to be required.
Sensitivity of the receptor – Agricultural Land Classification	Residual effect – Farm Holdings
4.2.2 The sensitivity of the receptor is assessed to be medium .	4.2.10 The residual effect following no further mitigation or enhancement is predicted to remain negligible, which is not significant in EIA terms.

	<p>Future monitoring</p> <p>4.2.11 No further monitoring is considered necessary.</p>	
4.3	<h2>Decommissioning phase</h2> <h3>Socio-Economics</h3> <p>Magnitude of impact – Socio-economics</p> <p>4.3.1 Decommissioning of the development is likely to involve the deconstruction and removal of all the structures now proposed. As with the construction phase before a project has gone out to tender, it is not possible to know with certainty the level of employment that would be generated during decommissioning. Taking into account current levels of economically active people in the study area, it is considered that decommissioning the development would result in a minor beneficial magnitude of impact in relation to socio-economic baseline conditions.</p> <p>Sensitivity of the receptor – Socio-economics</p> <p>4.3.2 The area considered by this assessment comprises the administrative area of Thurrock. Given the high level of unemployment in the area relative to the wider region, the sensitivity to socio-economic impacts is medium.</p> <p>Significance of effect – Socio-economics</p> <p>4.3.3 The significance of effects on socio-economic receptors during the decommissioning phase is assessed to be minor to moderate beneficial.</p> <p>Further mitigation or enhancement – Socio-economics</p> <p>4.3.4 No further mitigation or enhancement measures are considered to be required.</p> <p>Residual effect – Socio-economics</p> <p>4.3.5 The residual effect following no further mitigation or enhancement is predicted to remain minor to moderate beneficial, which is not significant in EIA terms.</p> <p>Future monitoring</p> <p>4.3.6 No further monitoring is considered necessary.</p>	<p>4.4 Cumulative effects</p> <p>4.4.1 Cumulative effects are those arising from impacts of the proposed development in combination with impacts of other proposed or consented development projects that are not yet built or operational. An assessment of cumulative effects for land use, agriculture and socio-economics has been made and is reported in Volume 4, Chapter 21: Land Use, Agriculture and Socio-Economics.</p>
		<p>4.5 Transboundary effects</p> <p>4.5.1 A screening of transboundary impacts has been carried out and is presented in Volume 6, Appendix 4.1: Transboundary Impacts Screening Note. This screening exercise identified that there was no potential for significant transboundary effects with regard to Land Use, Agriculture and Socio-Economics from Thurrock Flexible Generation Plant upon the interests of other EEA States.</p>
		<p>4.6 Inter-related effects</p> <p>4.6.1 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 Land Use, Agriculture and Socio-economics is provided in Volume 5, Chapter 31: Summary of Inter-Related Effects.</p> <p>Project lifetime effects</p> <p>4.6.2 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.</p> <p>Receptor-led effects</p> <p>4.6.3 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.</p>

5. Conclusion and summary

- 5.1.1 The project would permanently affect approximately 21.4 ha of lower quality Subgrade 3b agricultural land. The loss of this land is assessed to be of moderate significance, which does not represent a significant effect as it affects none of the best and most versatile agricultural land, referred to in the NPPF and falls outside of the requirement for formal consultation with Natural England where areas of greater than 20 ha of the best and most versatile land are affected.
- 5.1.2 Two large arable farming enterprises would be affected by the project. There would be a permanent loss of approximately 21 ha from Mill House Farm and approximately 0.4 ha from Goshems Farm. These losses would have no a limited effect on the operation of these holdings and these effects are assessed to be of negligible significance.
- 5.1.3 Impacts on recreational receptors would be limited to the pre-construction and construction phases of the project. The permanent loss of 10.03 ha of Access Land (comprising registered common land) in Zone A, together with the short-term temporary disruption of a maximum of 0.33 ha in Zone D1 and Zone F1/F2 during construction would be mitigated by the provision of a new area of 'replacement' permanent registered common (Access Land) totalling 11.6 ha.
- 5.1.4 This new area, which would also be contiguous with the remaining areas of The Green, Hall Hill, Fort Road, Parsonage and Walton Commons to the north, would be established in advance of construction to ensure that the rights of public access would not be interrupted. In addition, the creation of a new permissive footpath between Zone E and Fort Road would improve access on foot to the replacement common land and Parsonage Common to the north. Taking these factors into account, it is assessed that there would be a minor beneficial effect on common land resources.
- 5.1.5 During construction the Thames Estuary Path (along FP146) and NCR13 would remain along their current alignment with measures in place to manage the interface of construction traffic, pedestrians and cyclists. There would also be a short-term accessible diversion of a section of public footpath FP200 that has been agreed with Thurrock Council. Taking these factors into account it is assessed that there would be a temporary minor adverse effect on public rights of way.

- 5.1.6 It is estimated (conservatively) that an average of 250 no. FTE construction jobs would be created over the construction period. Additional jobs will be created during this phase through the induced effects of construction activity ('the multiplier effect') Given the high level of unemployment in the area relative to the wider region, the significance of effects on socio-economic receptors during the construction phase is assessed to be minor to moderate beneficial.
- 5.1.7 It is not expected that there will be any operational members of staff based full time at the site, routine maintenance being carried out by mobile operatives. As such the significance of effects on socio-economic receptors is assessed to be negligible.

Table 5.1: 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							
Agriculture							
Impact on ALC including permanent loss of agricultural land	None	Major	Medium to high	Moderate adverse (not significant in EIA terms)	None	Moderate adverse (not significant in EIA terms)	None
Impact on farm holdings	None	Negligible	Medium	Negligible (not significant in EIA terms)	None	Negligible (not significant in EIA terms)	None
Other land uses							
Permanent loss of Access Land (registered common land)	Provision of replacement land and new permissive route for pedestrians	Minor	Medium	Minor beneficial (not significant in EIA terms)	None	Minor beneficial (not significant in EIA terms)	None
Temporary disruption to Access Land (registered common land)							
Temporary disruption to public rights of way	Provision of temporary diversions/traffic management measures	Minor	Thames Estuary Path (medium) FP200 (low)	Minor adverse (not significant in EIA terms)	None	Minor adverse ((not significant in EIA terms)	None
Temporary disruption to national cycle network route 13 (NCR13)	Provision of traffic management measures	Minor	High	Minor adverse (not significant in EIA terms)	None	Minor adverse (not significant in EIA terms)	None
Socio-economics							
Direct creation of jobs	None	Minor	Low to medium	Minor to moderate beneficial (not significant in EIA terms)	None	Minor to moderate beneficial (not significant in EIA terms)	None
Indirect creation of jobs	None	Minor	Low to medium	Minor to moderate beneficial (not significant in EIA terms)	None	Minor to moderate beneficial (not significant in EIA terms)	None
Operation							
Agriculture							
Impact on ALC	None	Moderate	Medium	Moderate adverse (not significant in EIA terms)	None	Moderate adverse (not significant in EIA terms)	None
Impact on farm holdings	None	Negligible	Medium	Negligible (not significant in EIA terms)	None	Negligible (not significant in EIA terms)	None
Decommissioning							
Socio-economics							

Creation of jobs	None	Minor	Medium	Minor to moderate beneficial (not significant in EIA terms)	None	Minor to moderate beneficial (not significant in EIA terms)	None
------------------	------	-------	--------	---	------	---	------

6. References

- British Geological Survey (1998) Geological Survey of England and Wales 1:63,360/1:50,000 geological map series, New Series and corresponding 1:63,360 published Sheet 271 (Dartford). [Online] Available at: <https://www.bgs.ac.uk/data/maps/maps.cfc?method=viewRecord&mapId=10004> [Accessed 09 October 2019]
- British Geological Survey (n.d.) Geology of Britain Online] Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed 08 October 2019]
- Construction Industry Training Board (CITB) (2019). Workforce Mobility and Skills in the UK Construction Sector 2018 -2019. London, BMG Research.
- Department for Energy and Climate Change (DECC) (2011) Overarching National Policy Statement for Energy (EN-1). London, The Stationery Office.
- Department for Communities and Local Government (2015) English indices of deprivation 2015 [Online] Available at: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015> [Accessed 09 October 2019]
- Department for Food and Rural Affairs (DEFRA) (2011) Code of Construction Practice for the Sustainable Use of Soils on Construction Sites. London, DEFRA.
- Department for Food and Rural Affairs (DEFRA) (2015) SP1104: The Impact of climate change on the capability of soils for agriculture as defined by the Agricultural Land Classification - Policy brief [Online] Available at: <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16929&FromSearch=Y&Publisher=1&SearchText=sp1104&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description> [Accessed 09 October 2019]
- Department for Food and Rural Affairs (DEFRA) (2019a) Food, Farming and Bio-security statistics [Online] Available at: <https://www.gov.uk/government/collections/food-farming-and-bio-security-statistics> [Accessed 08 October 2019]
- Department for Food and Rural Affairs (DEFRA) (2019b) Structure of the agricultural industry in England and the UK at June [Online] Available at: www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june [Accessed 08 October 2019]
- Department for Environment, Food and Rural Affairs, Historic England, Natural England, Environment Agency Forestry Commission, and Marine Management Organisation (n.d.) Multi Agency Geographic Information for the Countryside (MAGIC). [Online] Available at: ([geographic information about the natural environment](http://magic.defra.gov.uk)) at <http://magic.defra.gov.uk> [Accessed 09 October 2019]
- HM Treasury (2003) The Green Book. [Online]. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf
- Highways England, Transport Scotland, Welsh Government and the Department for Infrastructure Northern Ireland (2019b) Design Manual for Roads and Bridges (DMRB), Volume 11, LA109: Geology and Soils.
- Highways England, Transport Scotland, Welsh Government and the Department for Infrastructure Northern Ireland (2019c) Design Manual for Roads and Bridges (DMRB), Volume 11, LA112: Population and Human Health.
- Homes and Community Agency (2014) Additionality Guide Fourth Edition 2014. London, Homes and Communities Agency.
- Institute of Environmental Management and Assessment (IEMA) (2004) Guidelines for Environmental Impact Assessment. Lincoln, IEMA.
- Keay, C., Jones, R., Procter, C.; Chapman, V., Barrie, I., Nias, I.; Smith, S., and Astbury, S. (2014) The Impact of climate change on the capability of land for agriculture as defined by the Agricultural Land Classification. [Online] Available at: <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16929&FromSearch=Y&Publisher=1&SearchText=sp1104&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description> [Accessed 09 October 2019]
- Ministry of Agriculture, Fisheries and Food (MAFF) (1971) Agricultural Land Classification, Provisional Sheets 161 (London NE) and accompanying Report (1971).
- Ministry of Agriculture, Fisheries and Food (MAFF) (1971 and 1972) Agricultural Land Classification, Provisional Sheet 171 (London SE) and accompanying Reports (1971 and 1976 respectively).
- Ministry of Agriculture, Fisheries and Food (MAFF) (1988) Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. October 1988. (Introduced in January 1989). [Online] Available at: <http://publications.naturalengland.org.uk/publication/6257050620264448> [Accessed 09 October 2019]
- Ministry of Housing, Communities & Local Government (2014) (updated July 2017) National Planning Practice Guidance: Environmental Impact Assessment. [Online] Available at: <https://www.gov.uk/guidance/environmental-impact-assessment> [Accessed 09 October 2019]
- Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework. UK, APS Group.
- MOHC (2018) UK Climate Projections User Interface v1.1.2, available <https://ukclimateprojections-ui.metoffice.gov.uk/ui/home>, accessed 24 December 2019
- Natural England (n.d.) Regional Agricultural Land Classification Maps. [Online] Available at:

<http://publications.naturalengland.org.uk/category/5954148537204736> [Accessed 08 October 2019]

Office of National Statistics (ONS) (2018) Subnational population projections for England: 2016-based. London, ONS.

Office of National Statistics (ONS) (n.d.) NOMIS (Official Labour Market Statistics). [Online] Available at: <https://www.nomisweb.co.uk/> [Accessed 09 October 2019]

Soil Survey of England and Wales (1984), National Soil Map Sheet 4 (Eastern England), 1:250,000. Southampton, Ordnance Survey. and accompanying Regional Bulletin (1989).

Sustrans (n.d.) The National Cycle Network. [Online] Available at: <https://www.sustrans.org.uk/national-cycle-network/> [Accessed 09 October 2019]

The Metrological Office (1889) Regional Bulletin (1984) The Met. Office Climatological data for Agricultural Land Classification. January 1989 [Online] Available at: <http://publications.naturalengland.org.uk/publication/6493605842649088> [Accessed 09 October 2019]

Therivel, R. and Wood, G. (2017) Methods of Environmental and Social Impact Assessment 4th Edition. New York, Taylor & Francis Ltd.

Thurrock Council (2015) Thurrock's Core Strategy and Policies for Management of Development (as amended). [Online] Available at: https://www.thurrock.gov.uk/sites/default/files/assets/documents/core_strategy_adopted_2011_amended_2015.pdf [Accessed 04 October 2019]

Thurrock Council (2016) Thurrock Economic Growth Strategy. [Online] Available at: <https://www.thurrock.gov.uk/sites/default/files/assets/documents/strategy-economic-growth-2016-v01.pdf> [Accessed 09 October 2019]

Thurrock Council (n.d.) Public Rights of Way (Thurrock Council) [Online] Available at: <https://www.thurrock.gov.uk/public-rights-of-way/public-rights-of-way-in-thurrock> [Accessed 09 October 2019]