



## The Progress Power (Gas Fired Power Station) Order

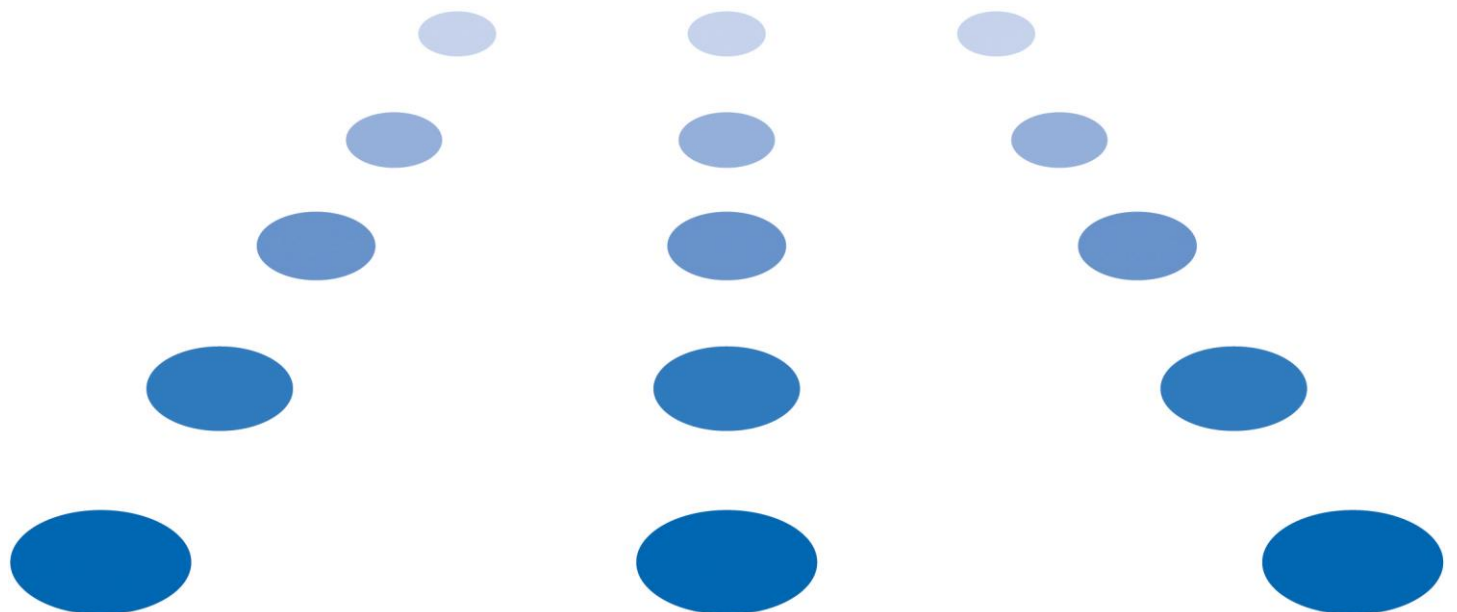
### 6.4 Environmental Statement Non-Technical Summary

#### Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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# PROGRESS POWER PROJECT ENVIRONMENTAL STATEMENT NON- TECHNICAL SUMMARY

*Progress Power Ltd*

3512438B

*Final*



# **Progress Power Project Environmental Statement Non- Technical Summary**

**3512438B**

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## GLOSSARY OF TERMS

Term	Abbrev.	Description
A140 Junction		Means the new junction from the A140 (Work No. 7 in the Draft DCO).
A140 Junction Site		Means the site of the A140 Junction (Work No. 7 in the Works Plan).
Above Ground Installation	AGI	Means the above ground installation incorporating the minimum offtake and the PIG trap launching facility together (Work No. 3A in the Draft DCO) with the access as (Work No. 3B in the Draft DCO).
Access Road		Means the access road following the Electrical Connection Route Corridor (Work No. 7 in the Draft DCO).
AGI Site		The site of the AGI and access (Work No. 3A in the Works Plan).
Cable		Means the cable circuit connecting the Electrical Connection Compound and the Power Generation Plant (Work No. 6 in the Draft DCO).
Carbon Monoxide	CO	A colourless, odourless, and tasteless gas that is produced from the partial oxidation of carbon containing compounds.
Combined Cycle Gas Turbine	CCGT	Gas plant technology system comprising Gas Turbine(s) fuelled by natural gas, a Heat Recovery Steam Generator(s) utilising heat from the Gas Turbine exhaust gases, and a steam turbine plant with associated condensing system.
Combined Heat and Power	CHP	A cogeneration power station capable of supplying power to the National Grid and also heat to local heat users (such as industry or leisure) through a direct connection to waste heat / steam produced as part of the combustion process.
Conceptual Site Model	CSM	The objective of constructing a Conceptual Site Model is to record all the potential pollutant linkages between the source of contamination and the receptors, i.e. the reasonably possible ways in which the receptors may experience exposure and consequent adverse effects.
Construction Environmental Management Plan	CEMP	Strategic document setting out best practice methods to minimise environmental impacts (including dust) during construction.

Desk Based Assessment	DBA	Research based primarily on database and internet data gathering methods.
Development Consent Order	DCO	Means a development consent order made by the Secretary of State pursuant to the Planning Act 2008 to authorise a nationally significant infrastructure project.
Development Consent Order Application		Means the application for a DCO made to the Secretary of State under section 37 PA 2008 in respect of the Project, required pursuant to section 31 PA 2008 because the Project constitutes a Nationally Significant Infrastructure Project under section 14(1)(a) and section 15 PA 2008 by virtue of being an onshore generating station in England or Wales of 50 MWe capacity or more.
Draft DCO		The draft DCO which accompanies the DCO Application (Document Number: 3.1).
Electrical Connection		Means the Cable, the Electrical Connection Compound, the Access Road and the A140 Junction.
Electrical Connection Compound		Means the substation and the sealing end compound (Work No. 5 in the Draft DCO).
Electrical Connection Compound Site		Means the site of the Electrical Connection Compound (Work No. 5 in the Land Plan).
Electrical Connection Route Corridor		Means the corridor in which the Cable is located (Work No. 6 in the Works Plan).
Electrical Connection Site		Means the site of the Electrical Connection (Works No. 5, 6 and 7 in the Works Plan).
Environmental Impact Assessment	EIA	The body of work which evaluates the potential likely significant environmental effects of the Project. Undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009.
Environmental Statement	ES	The final document which provides a comprehensive discussion on the Environmental Impact Assessment.
Gas Connection		Means the Pipeline and the AGI.
Gas Connection		Means the corridor in which the Pipeline is located (Work No. 4 in the Works Plan).



Route Corridor		
Gas Connection Site		Means the site of the Gas Connection (Works No. 3A, 3B and 4 in the Works Plan).
Gas Turbine	GT	In a Single Cycle Gas Turbine power plant (as proposed in the Power Generation Plant), the hot exhaust gases are routed directly to the stack without passing through a secondary steam turbine.
Heavy Goods Vehicle	HGV	Heavy goods vehicle means a mechanically propelled road vehicle that is of a construction primarily suited for the carriage of goods or burden of any kind and designed or adapted to have a maximum weight exceeding 3,500 kilograms when in normal use and travelling on a road laden.
Hectare	ha	A unit of area (10,000 m <sup>2</sup> / 2.471 acres).
Kilometre	km	Measurement of distance (1000 metres).
Kilovolt	kV	Measurement of the amount of electric potential energy.
Metre	m	Measurement of size.
Millimetre	mm	Measurement of size.
MWe		Means Megawatts electrical.
National Policy Statement	NPS	Overarching legislative policy concerning the planning and consenting of NSIPs in the UK.
National Transmission System		A network of gas pipelines throughout the United Kingdom that supply gas to power stations from natural gas terminals situated on the coast, and also gas distribution companies which lead indirectly to homes.
Nationally Significant Infrastructure Project	NSIP	The Project constitutes a Nationally Significant Infrastructure Project (NSIP) by virtue of s.14(1)(a) and s.15 of the Planning Act 2008 (PA 2008) which include within the definition of a NSIP any onshore generating station in England or Wales of 50 MWe capacity or more.
Nitrous Oxides	NOx	Gases produced during combustion, including nitric oxide (NO) and nitrogen dioxide (NO <sub>2</sub> ).
Noise Sensitive Receptor	NSR	Principally houses (existing or for which planning consent is being sought / has been given) and any building used for long-term residential purposes (such as a nursing home).

Non-Technical Summary	NTS	A summary of the Progress Power Project Environmental Statement in non-technical language.
Pipeline Inspection Gauge	PIG	Means a device to perform various maintenance operations on a pipeline.
Pipeline		Means the gas pipeline (Work No. 4 in the Draft DCO).
Planning Act 2008		UK legislation which passes responsibility for dealing with development consent applications for NSIPs to the Planning Inspectorate, who will examine applications and make recommendations for a decision by the relevant Secretary of State (the Secretary of State for Energy and Climate Change in the case of energy NSIP applications).
Power Generation Plant		A SCGT gas fired 'peaking' power generating plant capable of providing up to 299 MWe together with the maintenance area (Work No. 2 in the Draft DCO).
Power Generation Plant Site		The site of the Power Generation Plant (Works No. 1A, 1B, 1C, 1D and 2 in the Works Plan).
Progress Power Limited	PPL	A special purpose vehicle which has been set up to develop the proposed Project and has been established by Watt Power Limited (WPL). WPL has been established to develop flexible gas fired generation assets to support the UK Government drive to a low carbon economy. WPL has its project dedicated personnel sourced through an experienced management company, Stag Energy, founded in 2002.
Project		Means the Power Generation Plant, Electrical Connection and Gas Connection located on the Project Site.
Project Site		The entire area covered by the Project corresponding to the Order Limits of the Draft DCO.
Reciprocating Gas Engine	RGE	An engine that employs the expansion of hot gases to push a piston within a cylinder, converting the linear movement of the piston into the rotating movement of a crankshaft to generate power.
Secretary of State	SoS	The decision maker for a NSIP application and head of a government department.
Simple Cycle Gas Turbine	SCGT	Gas plant technology system comprising Gas Turbine(s) fuelled by natural gas. The hot exhaust gases are routed directly to the stack without passing through a secondary

		<p>steam turbine.</p> <p>The generating technology used for the Power Generation Plant.</p>
Site of Special Scientific Interest	SSSI	A geological or biological conservation designation denoting a protected area in the United Kingdom.
Special Areas of Conservation	SAC	Areas of protected habitats and species as defined in the European Union's Habitats Directive (92/43/EEC).
Special Purpose Vehicle	SPV	A legal entity created to fulfil the specific purpose of developing a power project.
The Developer		Means Progress Power Limited.
United Kingdom	UK	The territory of the United Kingdom.
Watt Power Limited	WPL	Means Watt Power Limited, established to develop flexible gas fired generation assets to support the UK Government drive to a low carbon economy. WPL has set up Progress Power Limited, a Special Purpose Vehicle to develop the Project.
Works Plan		Means the plans showing the numbered works referred to in the Order and submitted with the Application at Document Reference 2.7.

SECTION 1

**INTRODUCTION**



## 1 INTRODUCTION

### 1.1 Overview

- 1.1.1 This document is the non-technical summary (NTS) of the Environmental Statement (ES - Document Reference 6.1) for the Progress Power Project (hereafter referred to as the Project). It has been prepared by Parsons Brinckerhoff on behalf of Progress Power Limited (PPL).
- 1.1.2 PPL is promoting a new thermal generating station (hereafter referred to as the Power Generation Plant) on land at the former Eye Airfield located in Eye, Mid Suffolk, England, (approximate grid reference 613239 275109). The site for the Project (hereafter referred to as the Project Site) is shown in ES Figures 1.1 (Document Reference No: 6.3).
- 1.1.3 The Power Generation Plant will operate as a Simple Cycle Gas Turbine peaking plant and will be designed to provide an electrical output of up to 299 Megawatts. As a peaking plant, the Power Generation Plant would operate for up to 1500 hours per year.
- 1.1.4 Peaking plants are required to operate when there is a surge in demand for electricity associated with a particular event (e.g. where many people across the country boil kettles following the end of a popular television programme) or where there is a sudden drop in power being generated from plant which are constantly operational (e.g. a sudden outage).
- 1.1.5 Peaking plants also help to 'balance out' the grid at other times of peak electricity demand and help to support the grid at times when other technologies (e.g. renewable energy sources, such as wind and solar farms) cannot generate electricity due to their intermittent operation and reliance on weather conditions.
- 1.1.6 The Project constitutes a Nationally Significant Infrastructure Project under the Planning Act 2008, which means that a Development Consent Order is required to build, operate and maintain it. The proposed application for Development Consent will be processed and examined by the Planning Inspectorate who will make a recommendation to the Secretary of State for Energy and Climate Change on whether the Development Consent Order should be granted. The final decision on the Development Consent Order Application is made by the Secretary of State. The legal context of the Development Consent Order process is explained further in Section 1.3 of the ES.

1.1.7 The three main elements of the proposed Progress Power Project would comprise:

- A new **Power Generation Plant**, a Simple Cycle Gas Turbine gas fired power generating station capable of providing up to 299 Megawatts, incorporating up to five gas turbine generators with up to five exhaust gas flue stacks.
- A new electrical connection, (referred to as the **Electrical Connection**) to export electricity from the Power Generation Plant to the National Grid Electricity Transmission System. This element incorporates a new underground cable circuit connection (the **Cable**), and a new access road (the **Access Road**), with a new road junction off the A140 (the A140 Junction), and a new Electrical Connection Compound comprising a new substation (the **Substation**) and sealing end compound (the **Sealing End Compound**); and
- A new gas pipeline connection (referred to as the **Gas Connection**) to bring natural gas to the Power Generation Plant from the Gas National Transmission System in the vicinity of the Project Site. This element incorporates an above ground installation (**AGI**) at its southern end and a new access road off Potash Lane.

1.1.8 The Power Generation Plant, Electrical Connection, and Gas Connection are referred to as the **Project**. All of the land upon which the Project will be developed is referred to as the **Project Site**. The land upon which the Power Generation Plant is situated is referred to as the **Power Generation Plant Site**, the land upon which the Gas Connection is situated is referred to as the Gas Connection Site, the land upon which the Electrical Connection is situated is referred to as the Electrical Connection Site, the land upon which the Electrical Connection Compound is situated is referred to as the **Electrical Connection Compound Site** and the land upon which the AGI is situated is referred to as the **AGI Site**.

1.1.9 The Application for Development Consent includes the whole of the Project. The Project Site is shown in ES Figure 1.1 (Document Reference: 6.3). The Power Generation Plant Site, Gas Connection Site and Electrical Connection Site are shown in ES Figures 4.1, 4.2 and 4.3 (Document Reference: 6.3).

## 1.2 Needs and Benefits of the Project

1.2.1 There is a considerable national need for this type of project, acknowledged at all levels of government policy. National planning

policy supports the need for new electricity infrastructure due to the current ageing and inevitable closure of older coal fired power plants and the likely increase in demand for electricity over the coming decades.

1.2.2 The Government's policies in relation to Nationally Significant Infrastructure Projects are set out in National Policy Statements. Paragraph 3.6.1 of National Policy Statement EN-1 (Overarching National Policy Statement for Energy) states "Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix."

1.2.3 Gas is a reliable fuel source. It is acknowledged by the Government as being essential to a low-carbon economy and to underpin the country's energy security. In addition, gas peaking plants such as the Project provide back-up to power generation from renewable sources, particularly wind power, which is an increasingly prevalent but intermittent energy source. Modern gas fired power plants are among the most efficient and cleanest forms of electricity power generation.

1.2.4 At present, thermal peaking capacity in the UK is relatively small due to the nature of the electricity generation mix on the national electricity transmission system. There is therefore a clear and significant requirement for further capacity to meet the projected need for reactive/flexible generation. A dedicated gas fired peaking plant such as the Project could allow for the rapid provision of reserve capacity to the national electricity transmission system, thus playing a role in meeting the energy requirements of the UK going forward.

### 1.3 The Developer

1.3.1 The developer of the Project is Progress Power Limited (PPL). PPL is an energy development company established for the Project by Watt Power Limited (WPL). WPL has been established to develop flexible gas fired generation assets to support the UK Government drive to a low carbon economy. WPL is resourced through Stag Energy, a company founded in 2002.

1.3.2 For further details on PPL please visit: <http://www.progresspower.co.uk> or <http://www.wattpowerltd.co.uk>

### 1.4 Purpose of the Document

1.4.1 The Project requires an Environmental Impact Assessment (EIA) in accordance with the Infrastructure Planning (Environmental Impact



Assessment) Regulations 2009 (the EIA Regulations)<sup>1</sup>. EIA is an assessment of the Project's likely significant environmental effects. This document is a summary (in non-technical language) of the ES for the Project which details the results of the EIA. The full ES is available separately (Document Reference 6.1).

## 1.5 Planning Policy Context

1.5.1 The Department for Energy and Climate Change has published a number of National Policy Statements in relation to energy infrastructure, which were designated by the Secretary of State in July 2011. These National Policy Statements set out national policy against which proposals for Nationally Significant Infrastructure Projects are assessed and decided on.

1.5.2 Due to the nature of the Project (which will generate over 50 Megawatts of electricity), four of the designated National Policy Statements are considered relevant to the determination of the proposed Application for Development Consent:

- Overarching National Policy Statement for Energy EN-1: This sets out national policy for energy infrastructure as defined by the Planning Act 2008, which provides the primary basis for decisions by the Secretary of State. It recognises that there is a significant need for new energy infrastructure, which the Project supports. It states that pending plant closures in the UK will reduce available capacity by 22 Gigawatts by 2020 as a result of tightening environmental legislation and older power stations approaching the end of their useful life;
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure EN-2: This sets out policies specific to the determination of applications for fossil fuel electricity generating infrastructure;
- National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines EN-4: This sets Government policy on the relevant considerations and factors that should be taken into account as to route selection for developers for, inter alia, gas pipelines, although it is not directly related to this Project as it relates principally to more significant gas pipelines than the Gas Connection. It is therefore considered that the policies of this National Policy Statement are less likely to be important and

<sup>1</sup> Statutory Instrument 2009 No. 2263 Infrastructure Planning – The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009.

relevant in the determination of the Application for Development Consent; and

- National Policy Statement for Electricity Networks Infrastructure (EN-5): This provides the primary basis for decisions taken by the Secretary of State on applications it receives for electricity network Nationally Significant Infrastructure Projects, including the relevant considerations and factors that should be taken into account related to route selection. The Electrical Connection is not the relevant type (being underground rather than overhead) to be categorised as a Nationally Significant Infrastructure Project by itself, therefore it is considered that the policies of this National Policy Statement are less likely to be important and relevant in the determination of the Application for Development Consent.

1.5.3 National Policy Statement EN-1 states that consideration may be given to planning policy outside the National Policy Statements where it is important and relevant to the Secretary of State's decision. Further detail is provided in the ES (Document Reference No: 6.1) and Planning Statement (Document Reference No: 10.1).

1.5.4 The full list of documents submitted with the Development Consent Order application and the documents themselves are available:

- At the PINS NSIP website:  
<http://infrastructure.independent.gov.uk/>
- On CD and in hard copy: a CD copy can be purchased for £20 and a hard copy can be purchased for £250 from Progress Power Limited by emailing [info@progresspower.co.uk](mailto:info@progresspower.co.uk) or by calling 0131 550 3380.
- At The Planning Inspectorate's website:  
<http://www.planningportal.gov.uk/planning/planninginspectorate>



SECTION 2

**PROJECT AND SITE DESCRIPTION**



## 2 PROJECT AND SITE DESCRIPTION

### 2.1 Site and Surroundings

- 2.1.1 The Project Site is shown in ES Figure 1.1 (Document Reference: 6.3) and encompasses all three elements of the Project. Any temporary areas for equipment / material laydown, required during construction of the Project, would also be located within the Project Site. The Project Site lies entirely within the administrative boundary of Mid Suffolk District Council. The works are listed in Schedule 1 of the Draft Development Consent Order<sup>2</sup> and described in Section 4 of the ES.
- 2.1.2 The Power Generation Plant would be situated on land within the former Eye Airfield, approximately 1 km north west of Eye, 1.3 km west of Langdon Green, approximately 1.5 km east of Yaxley, in Mid Suffolk, and 4 km south of Diss in South Norfolk. The land within the former Eye Airfield has been designated as a Strategic Site for development by Mid Suffolk District Council.
- 2.1.3 The Power Generation Plant Site covers an area of approximately 10 ha. However, the footprint of the Power Generation Plant itself would be smaller than this (approximately 5.37 ha).
- 2.1.4 The Power Generation Plant Site is currently comprised of agricultural land surrounded by a belt of trees and earth bund to the east, over which lies the National Grid Gas Compressor Station. The immediate surrounding area is characterised by the remnants of the airfield, including the runway and associated access roads. Buildings that once formed part of the airfield have been replaced by units accommodating various industrial activities including a power generation facility (the 12.7 Megawatts Eye Chicken Litter Power Plant). Additionally, there are four large (130 m high) wind turbines located on the former Eye Airfield. Two turbines to the west of Potash Lane operated by Triodos Renewables and two more to the south of the Power Generation Plant Site at Baldwin Farm.
- 2.1.5 The Power Generation Plant Site is accessed from a private road to the south, Potash Lane, which in turn connects to Castleton Way, via the former main runway. Castleton Way provides connectivity to either from the B1077 to the east and the A140 to the west.
- 2.1.6 The Electrical Connection is proposed to run west over open agricultural land for a distance of approximately 1.5 km to the existing overhead power cables north east of the village of Yaxley. It is proposed to construct an Electrical Connection Compound at this

<sup>2</sup> Page 101, Document Reference 3.1.

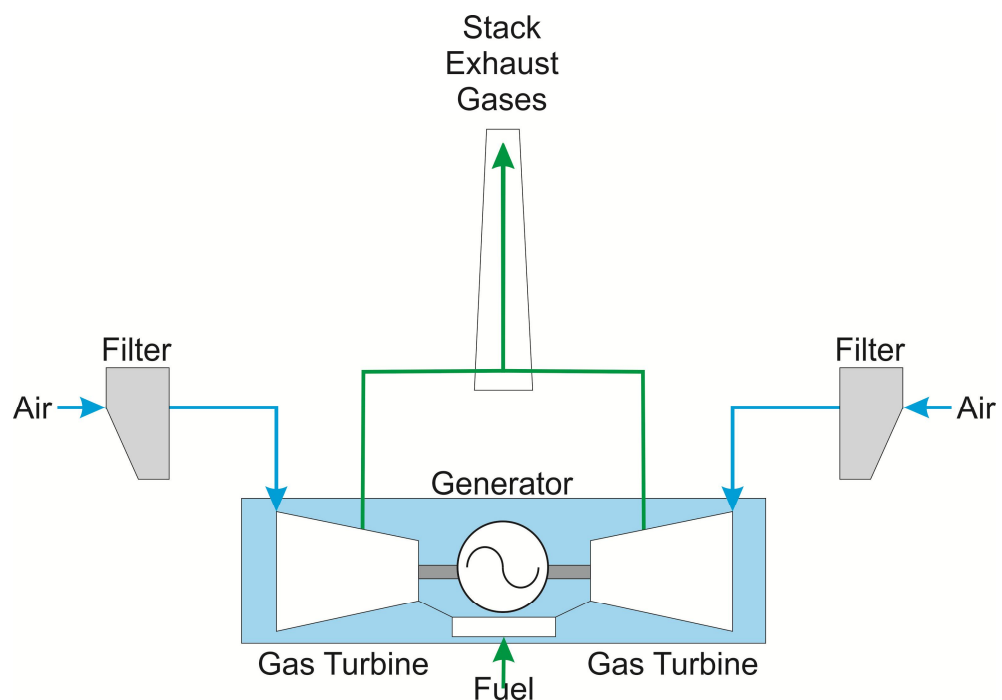
location. The surrounding area is mainly open agricultural land with scattered residential dwellings and the village of Yaxley to the south at a distance of approximately 500 m.

2.1.7 The Gas Connection will also largely cross agricultural land. Refer to Section 2.3 below for more information.

## 2.2 Power Generation Plant

2.2.1 The Power Generation Plant would be a peaking plant fired on natural gas. It will provide a total output of up to 299 Megawatts (enough to power the equivalent of 400,000 homes). Given these parameters, it has been determined that a Simple Cycle Gas Turbine plant is the preferred and most appropriate technology choice for the Project. Further detail is provided in Section 3.3 and a schematic showing this type of plant operation is shown below in Insert 1.

### Insert 1 – Simple Cycle Gas Turbine Schematic



2.2.2 The main equipment in a Simple Cycle Gas Turbine is a gas turbine generator, comprising of the following components:

- Inlet air filter;
- Air compressor;

- Combustion chamber;
- Power turbine; and
- Exhaust silencer.

- 2.2.3 In the gas turbines air is compressed and natural gas is injected. The fuel will then burn in the combustion chamber producing hot, high pressure gases. This gas expands across the blades of the gas turbine which drives the electrical generators to produce electricity. The exhaust silencer will reduce noise pollution from this process.
- 2.2.4 The waste gases and heat produced from this process will be released to the atmosphere via stacks (chimneys). The stacks will be equipped with emissions control equipment which will limit emissions of Nitrous Oxide (NOx) to the atmosphere by the use of water injection or dry low emission combustors.
- 2.2.5 A stack height sensitivity study has been undertaken for the Project which has determined that the minimum stack height for the Power Generation Plant, required for adequate dispersion of emissions and to meet legislative air quality targets, is 25 m. The maximum stack height would be 30 m. This height applies to all technology choices, as discussed below, and is not dependent on the number of units present at the site. Further information on this is provided in Section 6 of the ES<sup>3</sup>.
- 2.2.6 There are several options of Simple Cycle Gas Turbine plant available to generate up to 299 Megawatts. Simple Cycle Gas Turbine plants often use aero-derivative gas turbines (i.e. turbines derived from aeronautical applications), primarily because of their suitability for frequent start-ups, flexibility, high efficiency and high-availability maintenance techniques. For the aero-derivative case, PPL envisages using 3, 4 or 5 individual aero-derivative gas turbine generators to achieve 299 Megawatts.
- 2.2.7 However, 'industrial' type gas turbines can also be used which are typically larger and often more suited to longer operational hours. They offer similar efficiency but less fast loading flexibility. Industrial gas turbines differ from aeronautical designs in that the casings, rotors and blading are of heavier construction. For the industrial gas turbine case PPL would likely use 1 or 2 individual industrial gas turbine generators to achieve 299 Megawatts.

<sup>3</sup> Page 101, Document Reference 6.1.



- 2.2.8 The Development Consent Order Application is flexible enough to allow PPL to achieve a 299 Megawatts project by building between one to five gas turbines generators.
- 2.2.9 In addition to the main gas turbine generator units at the Power Generation Plant Site, the following would also be present:
- **Process Water Tank** - In order to provide make up water and store demineralised water to the plant.
  - **Fire Water Tank** - The fire water storage tank would be designed to comply with the relevant fire regulations and would be installed together with fire pumps, hose reels, fire hydrants and portable extinguishers.
  - **Control Building** – Required in order to monitor the plant operation and house plant controls.
  - **Workshop and Stores Building** - To store certain strategic and routine maintenance spares and to provide a facility for carrying out minor maintenance of the plant. .
  - **A Gatehouse** – Needed to provide security and maintain a log of site attendance, deliveries etc;
  - **A Switchyard / Banking Compound** - Required to connect the electrical infrastructure from the Power Generation Plant to transformers before export to the National Grid; and
  - **A Gas Receiving Station** - Required to meter and process gas coming from the NTS to feed into the Power Generation Plant Site at the correct flow and pressure conditions.
  - **Black Start Generator** – used to start the main GT's in the event of a failure of the grid i.e. no power is on the network, this is termed a black condition. Therefore in order to start the gas turbines a diesel generator is install on site to produce enough power to start the gas turbine).
- 2.2.10 An illustrative visual of the Power Generation Plant site is provided in Insert 2. The final layout proposal for the Power Generation Plant Site would incorporate a degree of flexibility with respect to the actual sizing and siting of the structures and buildings shown within the Power Generation Plant Site.
- 2.2.11 Sufficient spares will be held on site to ensure reliable operation of the plant. Periodic and routine maintenance would take place on average once every six months, to ensure optimal operation at all times.

2.2.12 Further detail is provided in Section 4.5 of the ES<sup>4</sup>.

### Insert 2 - Illustrative Visual of the Power Generation Plant Site



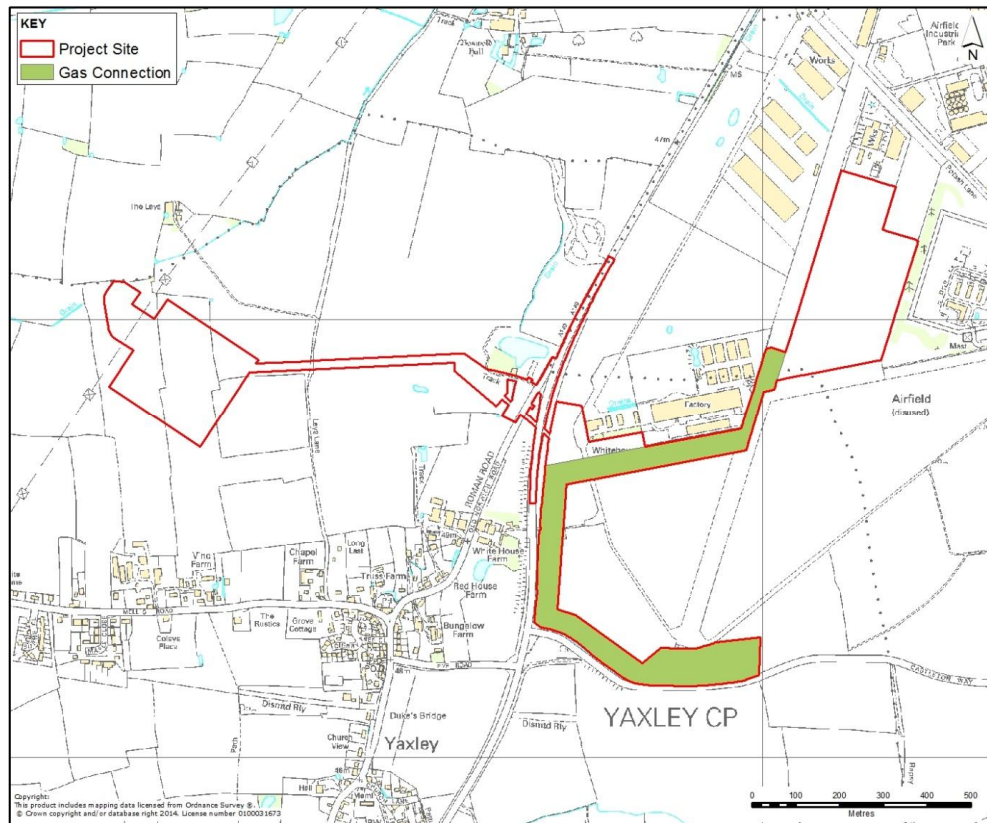
## 2.3 Gas Connection

- 2.3.1 A new underground gas pipeline (the Pipeline) would be required to connect the Power Generation Plant to the existing high pressure Gas National Transmission System in order to provide a reliable supply of fuel. Connection to the Gas National Transmission System at any high pressure pipeline would require two above ground facilities to be installed, a minimum offtake connection facility (containing monitoring and control equipment), which would be owned by National Grid, and a Pipeline Inspection Gauge trap launching facility (required for maintenance operations on the Pipeline) which would be owned by PPL. Together these form the AGI.
- 2.3.2 The Pipeline would run to the Power Generation Plant from Feeder 5 on the Gas National Transmission System (see Insert 3). The route of the Pipeline would begin at the new AGI, located to the south of the former Eye Airfield, north of Castleton Way and east of Potash Lane. From here the Pipeline would cross Potash Lane heading west and around the perimeter of an agricultural field. To the north of Whitehouse farm, the route would traverse east, south of the Speeddeck Factory, then turn north up the west side of Potash Lane before crossing the runway and continuing north into the south west

<sup>4</sup> Page 60, Document Reference 6.1

corner of the Power Generation Plant Site. The approximate length of the Pipeline would be 1.7 km.

**Insert 3 – The Gas Connection Site**



2.3.3 Construction and maintenance access to the AGI will be via a new road turn in off Potash Lane.

2.3.4 Construction of the Gas Connection would likely take place within a 50 m wide temporarily fenced strip of land along the Gas Connection Route Corridor, which would be increased or decreased in size where required (for example, decreased adjacent to nature conservation areas). It is expected that the Pipeline will be constructed using standard open-cut cross-country pipeline construction techniques (i.e. a trench). Trenchless techniques (e.g. Horizontal Directional Drilling) may be used in some locations to reduce impacts on sensitive areas. The main activities will include topsoil stripping; pipe stringing (the process of laying the pipe end to end) and welding; trench excavation; pipe laying (positioning of the welded pipe into the trench); back filling; pressure testing, drying and pipeline pigging operations; and reinstatement of the land.

2.3.5 Further detail is provided in Section 4.6 of the ES.

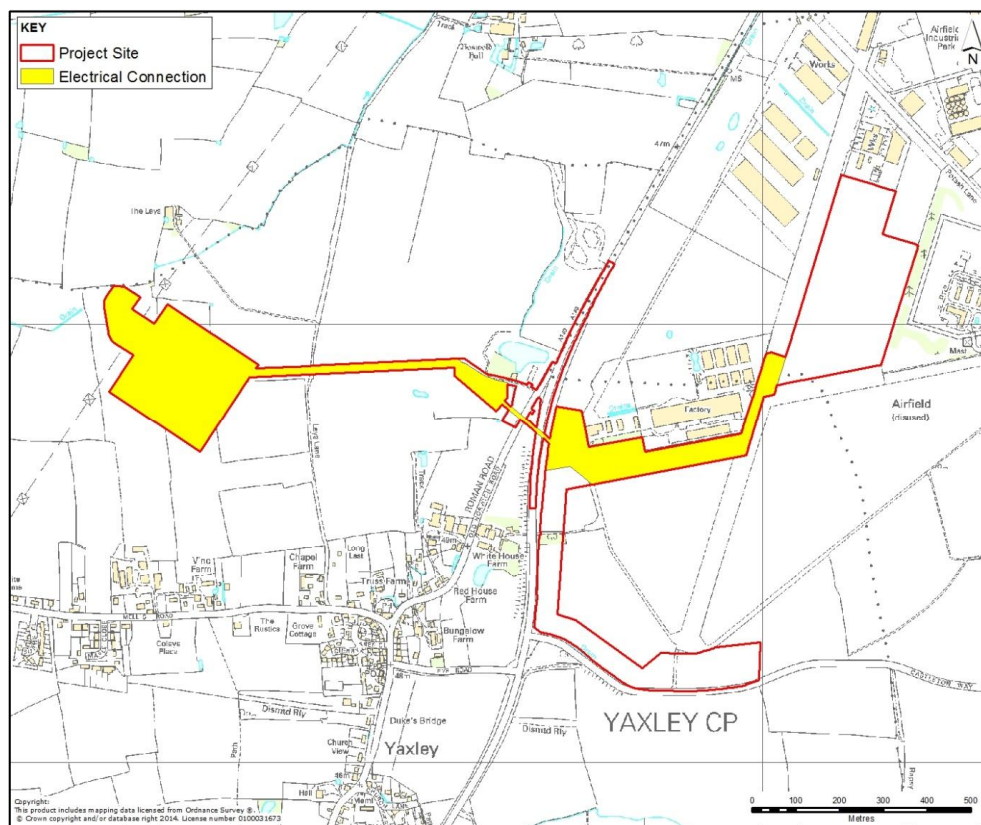
## 2.4 Electrical Connection

2.4.1 A new Electrical Connection would be required to allow electricity generated by the Power Generation Plant to be exported to the National Grid Electricity Transmission System. During the development of the Project, a number of connection options have been considered, arriving at the decision to connect via an underground cable from the Power Generation Plant Site to the existing 400 kilovolt overhead National Grid Electricity Transmission System to the north of Yaxley (refer to Section 3.5 below for further information).

### Electrical Connection Compound

2.4.2 To connect into the existing overhead lines, an Electrical Connection Compound is required. The location for the Electrical Connection Compound is shown on Insert 4, to the south of The Leys, west of Leys Lane.

### **Insert 4 – The Electrical Connection Site**



2.4.3 The outline design for the Electrical Connection Compound shows that it would be composed of a new Sealing End Compound and the Substation. The Sealing End Compound would be approximately 45 m

X 22 m located on the west side of the existing overhead line. A substation can either be an air insulated substation or a gas insulated substation. PPL considers that the Substation with air insulated technology is appropriate and acceptable in the location of the Electrical Connection Compound Site. The Substation with air insulated technology would be 150 m X 150 m, located on the east side of the overhead line. In the event that it is considered that for the Electrical Connection Compound Site the Substation should be of a gas insulated design, then the Substation would be 100 m x 80 m located on the east side of the overhead line. For the purposes of this ES, unless the text expressly states otherwise, references to "Substation" refers to both a substation with air insulated technology and a substation with gas insulated technology.

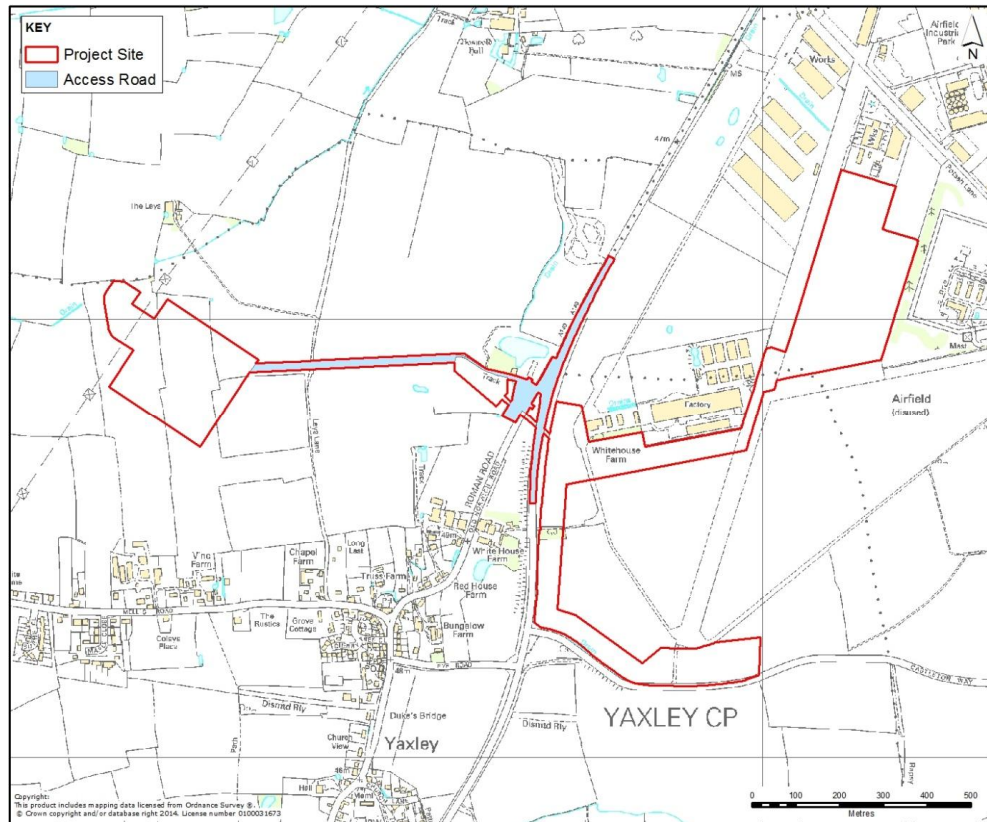
#### The Cable

- 2.4.4 The Cable would exit the western edge of the Power Generation Plant Site and head south down Potash Lane before turning west, to the south of the Speeddeck factory, and crossing the northern edge of the agricultural field towards the A140. At the A140, the Cable would pass under the road before heading in a westerly direction across the agricultural land towards the 400 kilovolt line. On the west of the A140, the Cable would cross the agricultural fields in a near perfect east – west orientation. To the west of these fields, the Cable would pass under Leys Lane and continue west, running parallel to an existing hedge line until it meets the Electrical Connection Compound Site (see Figure 4.3 Document Reference 6.3). The approximate length of the Cable would be 1.6 km.
- 2.4.5 Cable installation would follow a similar method to that for the Gas Connection. It would predominantly be carried out in an excavated trench with cable directly buried in the trench (open-cut method). The cable bedding will be laid and the cable pull set up. Once the cables are pulled in and the rollers removed, the cable surround can be installed with cable protection cover slabs placed over the cable. Finally, the backfilling and final reinstatement will be undertaken. Telemetry apparatus (within the cable trench) would report back any issues to a central control room during operation.
- 2.4.6 For cable installation across the A140, installation would use trenchless techniques (such as Horizontal Directional Drilling) to prevent the potential impacts to road traffic and to the small ponds located west of Old Norwich Road. The need for trenchless techniques may also be identified during detailed design of the Project.

Access Road and A140 Junction

- 2.4.7 Construction and maintenance access for both the Cable and Electrical Connection Compound would be via a new permanent access road to be constructed along the route of the Electrical Connection between the A140 and the Electrical Connection Compound Site (see Insert 5).

**Insert 5 – The Access Road and A140 Junction**



- 2.4.8 The A140 Junction will comprise a new three way highway junction (T-Junction) with 'Give Way' signals onto the A140. The track itself will be a single lane road with passing places.
- 2.4.9 Further detail is provided in Section 4.7 of the ES (Document Reference 6.1).

**2.5 Operation and Decommissioning**

- 2.5.1 The Power Generation Plant would be designed to have an operational life of up to 25 years, after which time it will be decommissioned or re-powered depending on the nature of the electricity market and energy mix at the time. The Electrical Connection Compound, AGI and respective cables and pipelines will be designed to be operational for

the life of the Power Generation Plant. For the purposes of the EIA, it will be assumed that all these elements will be decommissioned.

SECTION 3

**SITE SELECTION, ALTERNATIVES AND  
DESIGN EVOLUTION**





### 3 SITE SELECTION, ALTERNATIVES AND DESIGN EVOLUTION

#### 3.1 Introduction

3.1.1 The Project has gone through several iterations and evolutions in design, and the site selection itself has been an iterative process. The following alternatives have been considered for the Project as part of the design evolution process:

- Alternative development sites;
- Alternative layouts;
- Alternative technologies for electricity generation;
- Alternative options for the Electrical Connection; and
- Alternative options for the Gas Connection.

3.1.2 An overview of the alternatives that have been considered for the Project are provided below. Further detail is provided in Section 5 of the ES<sup>5</sup> and further detail on consultation is provided in the separate Consultation Report (Document Reference 5.1). Further discussion of alternatives and the suitability of the site can also be found in the Planning Statement (Document reference 10.1) and the Electrical Connection Sighting Report (Document reference 10.3).

#### 3.2 Alternative Development Sites

3.2.1 As part of a detailed feasibility assessment, WPL studied a range of sites around the UK to support power generation plants of this nature. The key factors which they considered necessary in a site were broadly four-fold: technical (e.g. the size of the site and the proximity to appropriate Gas and Electrical Connection points), environmental, economic and whether the proposals would be in line with local planning policy.

3.2.2 Based on these factors, the Project Site was considered suitable as it is within close proximity to the Gas National Transmission System and to high voltage electrical transmission infrastructure. The Project Site is also within an existing industrial estate, surrounded by similar industrial developments. The area is designated as a Strategic Site for development by Mid Suffolk District Council and Mid Suffolk District Council has aspirations to safeguard the area for an energy park. In

addition, there is more than adequate space to develop the Power Generation Plant and integral infrastructure.

### 3.3 Power Generation Plant

3.3.1 The following technology options were originally considered for the 299 Megawatt Power Generation Plant: Simple Cycle Gas Turbine plant, Combined Cycle Gas Turbine plant and Reciprocating Gas Engine plant. The potential for using Combined Heat and Power (CHP) opportunities using these technologies was also considered. The European Commission Directive 2004/8/EC promotes the used of Combined Heat and Power in the internal energy market and supports installation where there is a significant demand for heat.

3.3.2 PPL has undertaken a number of studies in relation to the technology choice and has concluded that a Simple Cycle Gas Turbine is the most suitable technology choice for generating up to 299 Megawatts as a peaking plant at the Power Generation Plant Site. This has been determined based on the following environmental, technical and feasibility considerations:

- Visual impact: the use of a Simple Cycle Gas Turbine plant over a Combined Cycle Gas Turbine plant limits the height of the stack(s) required and therefore the visual impacts associated with the Power Generation Plant. This is due to a Combined Cycle Gas Turbine plant needing a higher stack height to achieve adequate dispersion of emissions to meet air quality standards. The stack heights for a Simple Cycle Gas Turbine plant and a Reciprocating Gas Engine plant would be similar.
- Noise and available space: noise levels from a Simple Cycle Gas Turbine plant would typically be lower than for a Reciprocating Gas Engine plant, as the latter operates using ignition of gaseous fuels and air in a specific mix which causes motion of a piston to generate electricity. A larger number of Reciprocating Gas Engine units would also be required at the Power Generation Plant Site to generate up to 299 Megawatts; spatially this may not be possible.
- Emissions: Due to the method in which fuel is combusted in Reciprocating Gas Engine plants, there is also usually a requirement for additional control of NOx emissions in order to meet Industrial Emissions Directive guidelines. This additional NOx control would usually be in the form of Selective Catalytic Reduction which would not only require further landtake and more maintenance, but may also require ammonia or urea injection to operate. This then has impacts in terms of environmental disposal

- of catalysts, as well as ammonia slip which is released from the stack.
- **Water resources:** the water requirement of a Simple Cycle Gas Turbine plant is significantly lower than for a Combined Cycle Gas Turbine and Combined Heat and Power plant. The availability of water in the local area is extremely limited, there are no surface watercourses that would be suitable for abstractions, and although the Project Site is underlain by a principle aquifer PPL understands that this is already heavily abstracted, putting significant pressure on the local water supply, therefore a Simple Cycle Gas Turbine is more suitable.
  - **Financial:** compared to both Reciprocating Gas Engine plant and Combined Cycle Gas Turbine plant, Simple Cycle Gas Turbine units typically have a smaller capital cost per Megawatt installed. This is largely because Combined Cycle Gas Turbine plants are more complex in their operation, despite being more efficient. Reciprocating Gas Engine plants are also more flexible and allow operation on different fuels. However, the nature of the Power Generation Plant is that of a peaking plant which would operate for up to 1500 hours per year. Over this timescale, it is considered that the benefits in efficiencies or flexibility which can be achieved by using a Combined Cycle Gas Turbine plant or Reciprocating Gas Engine plant are very minimal and do not justify the additional capital costs of these plants. As Simple Cycle Gas Turbine plants are less complex in operation, they are also cheaper to construct and maintain.
  - **Start up times:** In order to respond in the most effective way to changing demands placed on the grid, peaking plants must be able to start up and generate electricity to their full capacity at short notice. Conversely, they also need to shut down rapidly and safely, so that excess electricity is not generated and then wasted when the demands on the grid even out and can be met by baseload plants. Simple Cycle Gas Turbine plants are able to start up and shut down much quicker than similar sized Combined Cycle Gas Turbine plants. Typically, a Simple Cycle Gas Turbine plant can start up to full load in around 15 minutes, whereas for a Combined Cycle Gas Turbine plant this could be as much as 2 hours (from hot) depending on the technology selected, and from cold, start up times are as much as 8 hours. Simple Cycle Gas Turbine plants are therefore better suited to meeting flexible demands.
  - **Efficiency:** Although Combined Cycle Gas Turbine plant typically have efficiencies of around 50-60% (compared with 40% for Simple Cycle Gas Turbine plant), these gains in efficiency are only realised

when the plant is up to running temperature and working continuously. For a peaking plant operating for a limited number of hours, efficiency gains are marginal and outweighed by the other environmental benefits and the fast start-up times of Simple Cycle Gas Turbine plants.

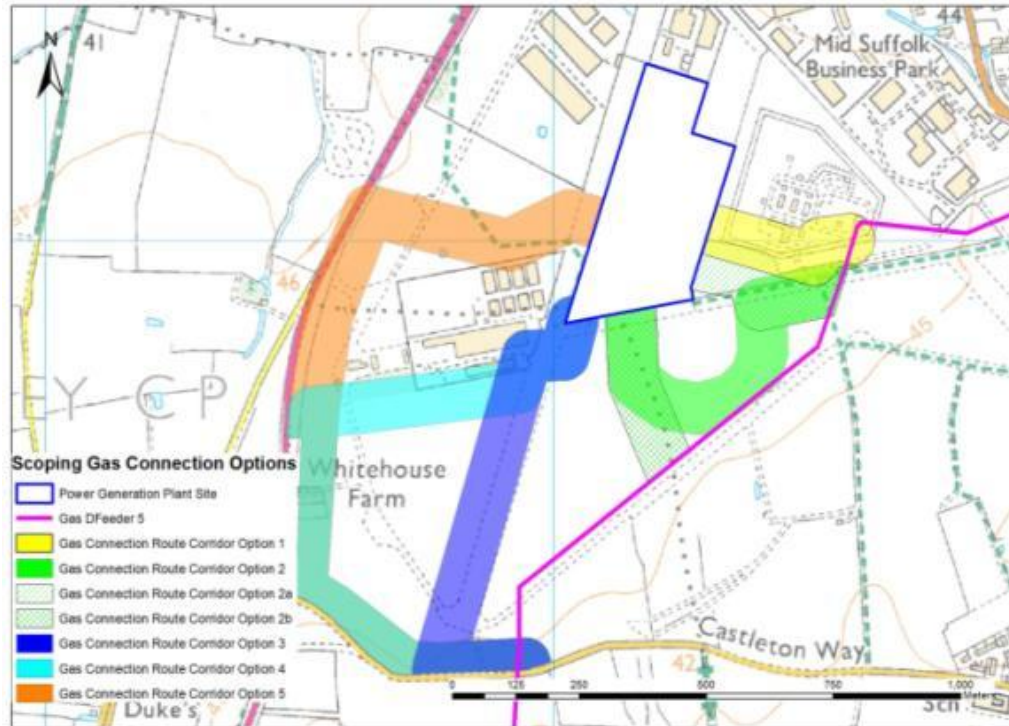
- 3.3.3 Combined Heat and Power is not considered to be technically or economically feasible with a Simple Cycle Gas Turbine peaking power station because the profile for the generation of electrical energy from the station cannot be guaranteed to coincide with the required heat demand profile of any potential consumer. Periods of electricity generation from the Project would typically be for 1-2 hours on occasional days, and of limited duration over the year. Heat demands, where they exist in the locality, are, by contrast, generally steady and persist over some 7 months of the year for residential heating or for the full year for industrial or commercial uses. This lack of demand coincidence renders the concept of Combined Heat and Power ineffective and unfeasible.
- 3.3.4 Unlike Combined Cycle Gas Turbine plants, Simple Cycle Gas Turbine plants do not produce steam as part of the electricity generating process, so the provision of Combined Heat and Power capability would require the addition of steam raising plant, resulting in a greater cost and visual impact (i.e. a higher stack). Furthermore, in order to generate steam a significant quantity of water would be required. The availability of water in the local area is extremely limited. There are no surface watercourses that would be suitable for abstractions and although the Project Site is underlain by a principle aquifer PPL understands that this is already heavily abstracted, putting significant pressure on the local water supply.
- 3.3.5 Maintaining a low capital cost for the Project is essential as plants selected to operate are chosen based on their ability to deliver fast reliable power at times of peak demand at the most economically advantageous price. Further information is provided in the Design Note on Combined Heat and Power (Document Reference 6.2, Appendix 5A).

## 3.4 Gas Connection

- 3.4.1 Seven potential Gas Connection Route Corridor options were assessed at the commencement of the Project (see Insert 6). All seven options connect to Feeder 5, a 600mm high pressure steel pipeline that runs between Yelverton to Stowmarket and passes to the south and east of the Power Generation Plant Site. Following consultation at both the

Scoping and Preliminary Environmental Information Report stage, a final preferred route corridor, Option 4, was chosen.

### Insert 6 – Gas Connection Route Corridor Options



- 3.4.2 After the Scoping stage, further analysis from additional studies determined that five of the Gas Connection Route Corridor options (Options 2, 2a, 2b, 3 and 5) were not feasible due to a combination of factors, including the proximity to recently consented wind turbines, the potential to render large areas of fields unusable and the potential to cause significant disruption to a currently busy and operational part of the former Eye Airfield Industrial Estate.
- 3.4.3 Options 1 and 4 were therefore taken forward for consultation at the Preliminary Environmental Information Report stage. Following consultation, Option 1, which is the shortest, was considered favourable due to its most direct and therefore less disruptive route. However, further studies and consultation with National Grid found that no safe route or connection point could be found within the National Grid Gas Compressor Station site. As such, this option had to be dropped on technical grounds.
- 3.4.4 The preferred option for the Gas Connection Route Corridor therefore is Option 4, which connects to the NTS at the south of the former Eye Airfield.

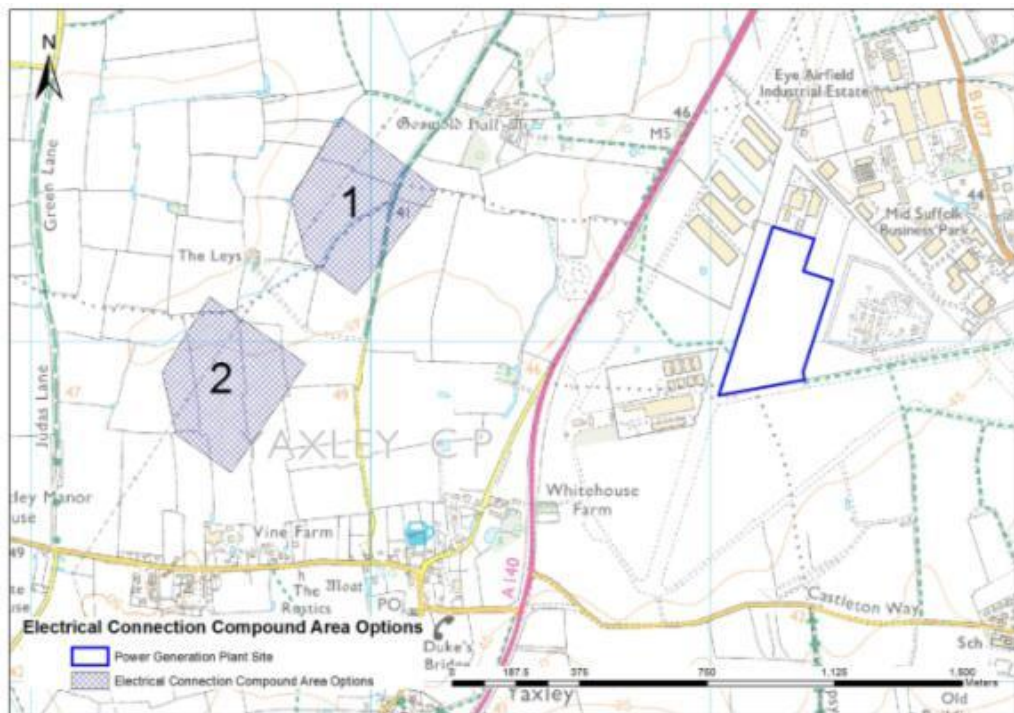
### 3.5 Electrical Connection

- 3.5.1 The Electrical Connection for the Project has been designed to provide the most technically acceptable, direct and least environmentally damaging route between the Power Generation Plant and the National Grid Electricity Transmission System, as described below.
- 3.5.2 At the Scoping stage, decisions about the exact nature and location of the Electrical Connection for the Project had yet to be made and the following two options were being considered:
- Option 1 - Bring the National Grid Electricity Transmission System 400 kilovolt line to the Power Generation Plant Site which would allow the Electrical Connection Compound to be located on the Power Generation Plant Site;
  - Option 2 - Locate the Electrical Connection Compound adjacent to the 400 kilovolt overhead lines and bring the 299 Megawatts generated by the Power Generation Plant to the existing network.
- 3.5.3 As such, an “Electrical Opportunity Area” was identified, which stretched from the Power Generation Plant Site in the east to just beyond the existing 400 kilovolt overhead lines in the west, and from just north of Yaxley in the south to Malting Farm in the north.
- 3.5.4 Further to this, an Electrical Connection Siting Report was undertaken by PPL (Document Reference 10.3). Due to environmental, technical and commercial considerations the location of the Electrical Connection Compound on the Power Generation Plant Site was discarded as a connection option. In addition, to ensure that the potential Electrical Connection Compound would not introduce unwanted visual impacts, it was decided that the search area for the siting study would be limited to an area that could be reached by an underground cable, thus ensuring that additional overhead lines could be ruled out at the offset.
- 3.5.5 A combination of ecological and cultural heritage constraints subsequently led to the elimination of all Electrical Opportunity Area land to the north of Goswold Hall. Due to the cluster of properties at The Leys, the remaining Electrical Opportunity Area land was further subdivided naturally into two separate areas (refer to Insert 7):
- Electrical Connection Compound Option 1: located to the south of The Leys, within agricultural land to the north of Mellis Road;

- Electrical Connection Compound Option 2: located to the north of The Leys, within agricultural land off Leys Lane between The Leys and Goswold Hall.

3.5.6 These options were consulted upon at the Preliminary Environmental Information Report stage.

### Insert 7 – Electrical Connection Compound Area Options



3.5.7 Following formal consultation and further analysis, it is considered that both options have the potential to give rise to adverse effects on visual amenity and landscape character. On balance, it is considered that Option 2 has the greater potential for adverse visual impacts (it is closer to residential receptors and potentially more exposed) and landscape impact (due to existing field boundary structure). However, it is also recognised that mitigation in the form of landscaping would be available and effective.

3.5.8 It is also considered that Option 1 has the potential to give rise to adverse effects on: an established watercourse which would require diversion and have consequences on the wider drainage network; a Public Right of Way which is an ancient Green Lane and would require diversion; mature trees and hedgerows and associated habitat (including biodiversity adjacent to the Green Lane) which would require removal; and buried archaeology.



- 3.5.9 As well as the environmental implications, it is considered that the potential adverse impacts associated with Option 1 (in particular the watercourse and drainage effects) have the potential to increase the technical difficulty and costs of development.
- 3.5.10 In view of the availability of mitigation for landscape and visual impacts, and the greater number of potentially adverse effects associated with Option 1, and the absence of other differentiating factors, Option 2 (the southern site) has been selected as the preferred location for the Electrical Connection Compound.
- 3.5.11 Having established a preferred Electrical Connection Compound location, the Electrical Connection Route Corridor has been designed in a manner that would have the least environmental impact, whilst also keeping agricultural loss and disruption to a minimum.
- 3.5.12 This has been achieved by selecting the most direct route possible from the A140 to the Electrical Connection Compound, maintaining a route that is, as close as possible to existing field boundaries to reduce disruption of historic field boundaries as well as farming practices, and avoiding sensitive ecological habitat.

SECTION 4

**ENVIRONMENTAL IMPACT ASSESSMENT**



## 4 ENVIRONMENTAL IMPACT ASSESSMENT

### 4.1 Environmental Impact Assessment Methodology

4.1.1 In accordance with Planning Act 2008 and the EIA Regulations, the EIA process for the Project incorporates the following (further detail is provided in Section 3 of the ES (Document reference 6.1)):

- Establishing, through consultation, the Scope of the EIA including obtaining a combined Screening and Scoping Opinion from the Secretary of State;
- Consideration of any potential technical and environmental alternatives;
- Establishing a comprehensive understanding of the existing baseline environmental conditions for the Project Site and the relevant study areas for each topic;
- Identifying the potential environmental impacts resulting from the Project;
- Determining how the potential environmental impacts can be avoided, reduced or off-set through informed design and / or further mitigation and how its benefits may be enhanced;
- Assessing the significance of the potential environmental impacts in conjunction with other impacts arising from the Project and those from other neighbouring developments and / or sources (in-combination and cumulative impacts); and
- Proposing options as to how any significant residual impacts will be mitigated, managed and monitored.

4.1.2 Before commencing the EIA for the Project, PPL requested a Scoping Opinion from the Secretary of State in May 2013, who then consulted bodies such as Mid Suffolk District Council, Natural England and the Environment Agency. The formal Scoping Opinion was received in June 2013 and is included in Appendix 3.B of the ES. Further consultation was subsequently undertaken based on a Preliminary Environmental Information Report which was issued in October 2013.

4.1.3 Throughout the following sections, the terms construction, operation and decommissioning have been used. These are defined as follows:

- **Construction** – Including site clearance, earthworks and general construction activities. Depending on the final plant selection, this is anticipated to take around 21 months.
- **Operation** – Operation of all aspects of the Project, including maintenance. The Project is anticipated to have a lifetime of approximately 25 years.
- **Decommissioning** – Removal of all Power Generation Plant, AGI and Electrical Connection Compound items and restoration of sites when the Power Generation Plant has reached the end of its operational life. This is anticipated to take a similar time to construction. It is likely that underground structures, including the Cable and Pipeline, would be left in situ to avoid any adverse environmental impacts associated with their removal.

4.1.4 To allow for a precautionary approach, the assessments in the ES have been based on a realistic worst case scenario specific to each topic area. For most topics this means assessing a Power Generation Plant configuration of five stacks at 30 m each, with the exception of air quality and ecology where five stacks at 25 m (the lowest possible height) are considered to represent the worst case scenario.

4.1.5 The assessments consider the sensitivity of a receptor and the magnitude of impact on a receptor. The significance of the effect on the receptor is then determined. Further detail is provided in the methodology section for each environmental topic in the ES (Document Reference 6.1) (Sections 6 - 15). A brief summary is provided below.

4.1.6 The sensitivity of a receptor is categorised from very high (for example an internationally designated site such as a Special Area of Conservation), high (for example a nationally designated site such as a Site of Special Scientific Interest), medium (for example a regionally designated site), low (for example a locally designated nature conservation site) to negligible (no sensitivity to change). The magnitude of impact on a receptor is categorised from major, moderate, minor, negligible to no change. The significance of the effect is then determined following the method shown below:

**Table 1 – Determining Significance of Effect**

		Magnitude of Impact				
		<i>No Change</i>	<i>Negligible</i>	<i>Minor</i>	<i>Moderate</i>	<i>Major</i>
Receptor Sensitivity	<i>Very High</i>	Neutral	Slight	Moderate	Large	Very Large
	<i>High</i>	Neutral	Slight	Moderate	Large	Large
	<i>Medium</i>	Neutral	Slight	Slight	Moderate	Large
	<i>Low</i>	Neutral	Slight	Slight	Slight	Moderate
	<i>Negligible</i>	Neutral	Neutral	Neutral	Neutral	Neutral

4.1.7 Unless otherwise stated, effects of moderate significance or above are considered to be significant for the purposes of the EIA Regulations.

4.1.8 The following sections provide a summary, in non-technical language of the main findings of the EIA, presented by topic. Each section provides a brief introduction, a summary of the baseline environment specific to that topic, a summary of the assessment of potential impacts and mitigation split by the Power Generation Plant, the Gas Connection and the Electrical Connection during construction, operation and decommissioning, a summary of the cumulative impacts and a summary of the residual impacts. All sections assess the impacts of the anticipated works to be undertaken by National Grid to connect the Electrical Connection Compound into the National Grid Transmission System (i.e. the existing 400kV overhead line). A summary of the mitigation measures and residual impacts for the overall Project for each environmental assessment topic is provided in the Conclusion section at the end of the NTS (Section 4.12).

4.1.9 A Habitat Regulations Screening Assessment was also undertaken due to the proximity of the Project Site to a Special Area of Conservation and a Ramsar Site. This No Significant Effects Report can be found at Document Reference 5.7.

## 4.2 Air Quality

### Introduction

4.2.2 The construction, operation and decommissioning of the Project have the potential to impact on air quality both through the generation of dust during the construction and decommissioning phases and from stack emissions during operation.

- 4.2.3 A desk based assessment, together with air dispersion modelling has been carried out to assess any potential air quality impacts resulting from the Project on identified receptors. These include residential settlements nearest to the Power Generation Plant Site; namely Eye, Yaxley, Brome, Mellis and Diss and sensitive ecological receptors within 10 km of the Project Site. The full assessment for this topic is provided in Section 6 of the ES (Document Reference No: 6.1). A brief summary is provided below.

Baseline

- 4.2.4 The Project Site is located in Mid Suffolk District Council. In their 2011 Air Quality Progress Report<sup>6</sup>, Mid Suffolk District Council reported that no areas were exceeding the Air Quality Objectives.

Assessment of Potential Impacts

*Power Generation Plant*

Construction

- 4.2.5 The main potential impacts resulting from construction of the Power Generation Plant on air quality are from dust generated from construction activities (e.g. earthworks, stockpiling, materials transport etc.). There is also a small potential for impacts arising from exhaust emissions from on-site plant (e.g. diesel generators) and construction traffic.
- 4.2.6 Despite this, it is considered unlikely that levels of atmospheric dust would be generated which would constitute a health hazard or nuisance to local people or industry. For ecological receptors, potential risks relate to the deposition of dust onto foliage. However, given the nature of the area surrounding the site (agricultural land, with the potential for bare soils during normal use) risks of dust deposition are unlikely to be significantly greater than at present.
- 4.2.7 Impacts would be minimised through successful implementation of an agreed Construction Environmental Management Plan (a draft of which is provided in Appendix 4A of the ES), which would incorporate appropriate dust mitigation measures such as damping down or covering of stock piles and excavations during dry and windy weather. Additionally, the majority of particulates from construction activities settle within short distances of construction sites. Impacts on receptors are therefore considered negligible following implementation of the Construction Environmental Management Plan.

<sup>6</sup> 2011 Air Quality Progress Report for Babergh District Council and Mid Suffolk District Council, April 2011

#### Operation

- 4.2.8 The main potential impacts arising from operation of the Power Generation Plant are associated with the stack emissions arising as a result of the combustion of natural gas. Emissions from the stack(s) include NO<sub>x</sub> and carbon monoxide (CO).
- 4.2.9 However, modern gas fired power plant are inherently clean and produce far fewer emissions than other fossil fuel power plants (e.g. coal) when compared on an energy output basis. Emissions of both NO<sub>x</sub> and CO are strictly limited under national and international guidelines such as the Industrial Emissions Directive.
- 4.2.10 Air quality modelling has shown that an appropriate stack height (25 m minimum and 30 m maximum) would achieve adequate dispersion of NO<sub>x</sub> and CO to meet legislative limits and prevent any significant impacts to identified receptors. For nitrogen and acid deposition no significant effects on habitats are expected as a result of the operation of the Power Generation Plant.

#### Decommissioning

- 4.2.11 During decommissioning, temporary air quality impacts are likely to arise due to dust and particulate matter emissions. It is likely that these impacts would be similar to those of the construction phase. The principal effects would arise due to demolition / removal of installations and earthworks, but impacts can be reduced to negligible significance with the application of the mitigation measures set out for construction phase.

#### *Gas Connection*

##### Construction

- 4.2.12 As with the Power Generation Plant, the main potential impacts on air quality resulting from construction of the Gas Connection are from dust generated from construction activities (e.g. earthworks, stockpiling, materials transport and trenching etc.). Impacts on receptors are considered negligible following implementation of the Construction Environmental Management Plan.

##### Operation

- 4.2.13 During operation of the Gas Connection there would be no impacts to air quality as the AGI does not routinely produce emissions to air.



#### Decommissioning

- 4.2.14 During decommissioning, temporary air quality impacts are likely to arise due to dust and particulate matter emissions. The principal effects would arise due to demolition / removal of installations and earthworks associated with the AGI, but impacts can be reduced to negligible significance with the application of the mitigation measures set out for construction phase. It is likely that the Pipeline would be left in-situ which would reduce impacts to levels below those seen during construction.

#### *Electrical Connection*

#### Construction

- 4.2.15 As with the Power Generation Plant, the main potential impacts on air quality resulting from construction of the Electrical Connection are from dust generated from construction activities (e.g. earthworks, stockpiling, materials transport and trenching etc.). Impacts on receptors are considered negligible following implementation of the Construction Environmental Management Plan.

#### Operation

- 4.2.16 No significant air quality impacts will arise as a result of the operation of the Electrical Connection as the infrastructure itself does not routinely produce emissions to air. In the event that the Electrical Connection Compound is comprised of a gas insulated substation, the potential for emissions to air of sulphur hexafluoride (SF<sub>6</sub>) would arise. SF<sub>6</sub> is not toxic to humans, but is a powerful greenhouse gas. As such, a programme of leakage detection and prevention will be put in place to minimise emissions of the insulating gas, sulphur hexafluoride (SF<sub>6</sub>).

#### Decommissioning

- 4.2.17 During decommissioning, temporary air quality impacts are likely to arise due to dust and particulate matter emissions. It is likely that these impacts will be similar to those described above for construction. The principal effects would arise due to demolition / removal of installations and earthworks associated with the Electrical Connection Compound, but impacts can be reduced to negligible significance with the application of the mitigation measures set out for construction phase.
- 4.2.18 In the event that the Electrical Connection Compound is comprised of a gas insulated substation, procedures will be put in place to reclaim, with minimal losses, the SF<sub>6</sub> gas prior to demolition or decommissioning of

the substation housing. The impacts of decommissioning on the release of SF<sub>6</sub> will therefore be negligible.

#### Cumulative Impacts

- 4.2.19 For air quality, cumulative impacts generally relate to multiple schemes with the potential to generate emissions to air. The impacts of third party combustion facilities (namely the National Grid Gas Compressor Station and Eye Power Station) in the vicinity of the Power Generation Plant Site are implicitly included in the baseline and operational impact assessments.
- 4.2.20 Cumulative impacts during operation of the Power Generation Plant are possible where nearby wind turbine developments have the potential to affect the dispersion of the emissions from the stack(s). As a result, the cumulative impacts of the Eye Airfield and Eye Wind Power Ltd wind turbines and the Project have been assessed using dispersion modelling. This has concluded that no significant cumulative impacts are predicted and that the overall conclusions of the impact assessment hold for both the Power Generation Plant operating alone and in combination with nearby industrial processes.
- 4.2.21 There is also the potential for cumulative construction impacts with the Project during the temporary diversion of the existing overhead line in the vicinity of Electrical Connection Compound. Whilst works associated with the overhead line diversion and the construction of the Electrical Connection Compound may overlap in time, no significant cumulative impacts are predicted since impacts from the overhead line will be spatially limited and works at both the same time and location are unlikely.

#### Residual Impacts

- 4.2.22 Based on the results of the environmental assessment, taking into account potential mitigation measures, the air quality impacts of the Project will not give rise to any significant effects on sensitive habitats or human health during construction, operation or decommissioning.

### **4.3 Noise and Vibration**

- 4.3.1 The construction, operation and decommissioning of the Project have the potential to impact upon local noise levels and generate vibration, which may impact on sensitive receptors.
- 4.3.2 A desk based assessment, a noise survey and noise modelling have been undertaken to make an assessment of the potential noise impacts

caused by the Project. The full assessment for this topic is provided in Section 7 of the ES (Document Reference No: 6.1). A brief summary is provided below.

#### Baseline

4.3.3 The baseline noise climate in the area of the Power Generation Plant Site is largely dominated by road traffic during the daytime. During the night time when road traffic levels reduce, a continuous low level noise can be heard from the Eye Power Station. The baseline noise climate in the area of the Gas and Electrical Connections is largely dominated by road traffic during the daytime and evening, with occasional distant road traffic during the night time.

4.3.4 Background noise measurements were made at eight Noise Sensitive Receptors in the vicinity of the Project Site in order to determine the existing baseline noise climate (refer to the ES<sup>7</sup> for further information). Six of these locations were concentrated on the Power Generation Plant Site and two on the Electrical Connection Compound Site. These locations were agreed in consultation with Mid Suffolk District Council, Suffolk County Council and the Environment Agency.

#### Assessment of Potential Impacts

4.3.5 For the purposes of this Noise and Vibration section, the assessments of the Power Generation Plant, Gas Connection and Electrical Connection are presented together for the Project under the headings of Construction, Operation and Decommissioning. This differs from the general section structure described in Section 4.1 to reduce repetition.

#### *The Project*

##### Construction

4.3.6 Construction activity inevitably leads to some degree of noise disturbance at locations in close proximity to the construction activities. It is, however, a temporary source of noise. Noise at the Project Site could arise, for example, from excavation for foundations, delivery of plant and trenching activities. Based on a conservative, worst case assessment, where numerous large plant items are operating simultaneously across the Project Site, the overall impact of construction noise from the Project is predicted to be minor adverse at all noise sensitive receptor locations, which is not significant. This assumes the use of best available techniques to reduce noise and the

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<sup>7</sup> Section 7.8, Document Reference 6.1.

successful implementation of an agreed Construction Environmental Management Plan, which would include noise reducing measures.

4.3.7 It is considered that the noise impact from construction traffic using existing local roads would be negligible, given that the increase in traffic flow during construction would be below 25%. However, noise modelling has been conducted to determine the impact on Noise Sensitive Receptors from construction traffic using the Access Road between the A140 Junction and the Electrical Connection Compound. Based on the results, it is predicted that the overall impact of construction noise traffic using the Access Road is minor at all Noise Sensitive Receptors.

4.3.8 Vibration from construction activities (e.g. piling activities) may impact on adjacent buildings. However, with the distances involved between the Project Site and sensitive receptors, the vibration impact is predicted to be negligible.

#### Operation

4.3.9 In order to predict operational noise from the Project, noise modelling has been undertaken using sound power levels from representative plant items. The predicted noise levels from the noise modelling exercise have then been compared to the measured background noise at the Noise Sensitive Receptors. Note the noise modelling takes into account operational noise from both the Power Generation Plant and the AGI (part of the Gas Connection). Operational noise from the Electrical Connection has not been modelled as, although there will be a low level electrical hum produced at the Electrical Connection Compound this will not be perceptible at the Noise Sensitive Receptors. In addition, in the event that the Electrical Connection Compound is comprised of a substation with gas insulated technology some low level noise would be produced from the operation of circuit breaker switching devices. These switches would, however, have very occasional usage (several times in a typical year), would operate for a very short duration (fraction of a second) and would be housed within the substation building, further mitigating any noise.

4.3.10 Based on British Standard 4142, the assessment has shown that at Noise Sensitive Receptors 2 and 5 the impact of operational noise from the Power Generation Plant and AGI is minor adverse and not significant.

4.3.11 At Noise Sensitive Receptors 1, 3, 4, 6, 7 and 8 background noise levels were found to be below the British Standard 4142 assessment threshold. As such, these Noise Sensitive Receptors have been

assessed using a combination of British Standard 8233 and the World Health Organisation guidelines.

- 4.3.12 External noise levels from the Power Generation Plant and the AGI are well below the World Health Organisation guideline for minimal and moderate annoyance at Noise Sensitive Receptors 1, 3, 4, 6, 7 and 8. The impact of operational noise at these Noise Sensitive Receptors is therefore considered to be negligible.
- 4.3.13 Internal noise levels at Noise Sensitive Receptors 1, 3, 4, 6, 7 and 8 comfortably achieve the British Standard 8223 'Good' design range for resting and sleeping conditions in the living rooms and bedrooms of residential dwellings. The impact of operational noise from the Power Generation Plant and AGI on internal noise levels within these Noise Sensitive Receptors is therefore negligible.
- 4.3.14 Detailed design will ensure that noise is mitigated as far as possible, through the Power Generation Plant Site and AGI layout and consideration of the orientation of plant items associated with higher sound power levels. Inherently quiet plant items will be selected wherever practicable. In addition high performance silencers will be fitted to achieve maximum noise attenuation on plant including gas turbine inlets and ductwork. Acoustic lagging and low noise trims will be fitted to all pipe-work and noise generating steam valves and high performance acoustic enclosures will be considered for all plant items where practicable.
- 4.3.15 In addition, to ensure that the predicted operational noise levels are not exceeded, and to ensure that any breaches can be remedied, noise limits would be set at specific measurement locations on the boundary of the Project Site.
- 4.3.16 During operation, vibration effects are anticipated to be unnoticeable at the nearest sensitive receptors. All plant items would also be designed and positioned so that they do not generate vibration impacts.

#### Decommissioning

- 4.3.17 During decommissioning of the Project, similar noise impacts to those predicted during construction would be experienced (i.e. minor adverse at all receptors and not significant) assuming the application of the mitigation measures set out for construction phase. As with construction, the vibration impact is predicted to be negligible.

#### Cumulative Impacts

- 4.3.18 There is the potential for cumulative construction impacts with the Project during the diversion of the existing overhead line in the vicinity of Electrical Connection Compound and construction of the terminal tower. However, provided best available techniques are used to minimise noise and vibration during the works the cumulative impact is considered to be minor, which is not significant.

Residual Impacts

- 4.3.19 Based on the results of the environmental assessment, taking into account potential mitigation measures, the Project will not result in any likely significant noise and vibration effects during construction, operation or decommissioning.

## 4.4 Ecology

Introduction

- 4.4.1 The construction, operation and decommissioning of the Project have the potential to impact upon sensitive ecological receptors.
- 4.4.2 In order to assess the current ecological conditions at the Project Site the following steps have been undertaken:
- Ecological consultations with statutory and non-statutory stakeholders to understand where the areas of potential ecological sensitivity are located;
  - Desk studies, site walkovers and habitat classification studies known as “Extended Phase 1 Habitat Surveys” undertaken to assess the habitats present and their potential to support notable species at the Project Site and immediate vicinity;
  - Following the Extended Phase 1 Surveys, the resulting information was used to inform species specific surveys termed “Phase 2 protected species surveys”, involving field based assessments to determine the presence / absence of notable species and their population size where present.
- 4.4.3 The study area is 10 km from the Project Site for European and nationally designated sites, 2 km for local/non-statutory designated sites and up to 1 km for desk study records of protected and notable species (extended to 10 km from the Project Site for bat species). Field surveys were undertaken in individually defined survey areas.

4.4.4 The full assessment for this topic is provided in Section 8 of the ES. A brief summary is provided below.

Baseline

4.4.5 The assessments undertaken have identified sensitive ecological areas and species in close proximity to the Project Site, including a number of statutory designated sites (see Figure 8.1 (Document Reference 6.3)). Thirteen statutory designated sites were identified within 10 km of the Project Site. Of these the following seven are considered to be within the zone of influence for ecology, although none are located within the Project Site: Redgrave and Lopham Fens Ramsar Site, Site of Special Scientific Interest and National Nature Reserve; Waveney & Little Ouse Valley Fens Special Area of Conservation; Major Farm, Braiseworth Special Scientific Interest; Gypsy Camp Meadows, Thrandeston Special Scientific Interest; and The Pennings, Eye Local Nature Reserve.

4.4.6 Three non-statutory designated sites are also present within 2 km of the Project Site (see Figure 8.2 (Document Reference 6.3)): Braiseworth Wood / Stegall's Wood County Wildlife Site, Suffolk Wildlife Trust Reserve; Mellis Common County Wildlife Site; and Thrandeston Marsh County Wildlife Site.

4.4.7 A large proportion of the Project Site is situated within arable farmland, which is of limited nature conservation value. More valuable habitats present include species-rich hedgerow with trees, species-poor hedgerow with trees, species-poor intact hedgerow, semi-natural broadleaved woodland and two standing water bodies (Yaxley Lake and adjacent wet ditch to the south)

4.4.8 Phase 2 protected species surveys were undertaken for badgers, bats, breeding birds, reptiles and great crested newts. The surveys recorded locally important populations of foraging and commuting bats, wintering birds and brown hares. The breeding bird assemblage of the Project Site is considered to be of district level importance.

4.4.9 Great crested newts were recorded within one pond approximately 1 km to the north of the Project Site; however a number of water bodies within the survey area could not be surveyed due to access and / or health and safety restriction limitations. Given this a precautionary approach has been adopted whereby a medium population of great crested newts is assumed present in all suitable habitats (which are limited within the Project Site to field margins). Further detailed great crested newt surveys will be carried out to inform the need for a European Protected Species Mitigation Licence for the Project. Should

great crested newts be found present a European Protected Species Mitigation Licence application will be produced and submitted to Natural England for consideration.

- 4.4.10 A small proportion of the habitat within the Project Site may be suitable for grass snake. Mitigation would therefore be implemented during the construction phase of the Project in line with their legal protection and as good ecological practice.

#### Assessment of Potential Impacts

##### *Power Generation Plant*

##### Construction

- 4.4.11 During construction, potential impacts on ecological receptors could occur from habitat loss or disturbance, increased noise and vibration, increased dust, or accidental release of water-borne pollutants. The impacts could lead to effects on habitats within and adjacent to the Power Generation Plant Site.
- 4.4.12 Construction activities could also result in disturbance or incidental mortality of species using habitats within and adjacent to the Power Generation Plant, principally brown hares, foraging and commuting bats, breeding birds and wintering birds. Note the Power Generation Plant Site would not result in the loss, fragmentation or destruction of any suitable great crested newt habitat.
- 4.4.13 A variety of measures would be used to avoid, minimise and mitigate impacts. These include embedded measures within the design of the Project, such as altering the layout to reduce the impact on ecological receptors, as well as the successful implementation of an agreed Construction Environmental Management Plan, which would include pollution control measures. In addition, the landscaping strategy will incorporate significant hedgerow and woodland habitat planting which will provide a net gain in habitat quality, and will also improve the green infrastructure (habitat connectivity) across the arable landscape.
- 4.4.14 Following the implementation of mitigation, no significant adverse effects on ecological receptors are predicted during construction of the Power Generation Plant.

##### Operation

- 4.4.15 During operation of the Power Generation Plant, the main potential impacts to ecology would arise from stack emissions impacting on



ecologically sensitive sites. This is through deposition of nitrogen and acidification to habitats. An increase in nitrogen deposition above the critical load can cause a change in plant communities. An increase in acid deposition above the critical load can cause a decrease in soil base saturation and may cause toxicity to plants. However, the specified stack height for the Power Generation Plant will ensure that any impacts on ecological receptors are negligible and not significant.

- 4.4.16 Other potential impacts during operation include increased light spill and noise affecting brown hares, foraging and commuting bats, breeding birds and wintering birds. The lighting scheme for the Power Generation Plant will ensure minimal light spillage and directional lighting therefore ensuring that compensatory habitat is not lit and suitable for use as nesting, commuting and refuge for wildlife. Following appropriate mitigation, impacts are not expected to lead to significant adverse effects on ecological receptors.

#### Decommissioning

- 4.4.17 During decommissioning, similar impacts to those predicted during construction may be experienced as the construction and decommissioning phases would involve similar activities.

#### *Gas Connection*

#### Construction

- 4.4.18 The majority of the potential impacts associated with the construction of the Gas Connection would be temporary in nature and related to habitat disturbance whilst the trench is being excavated and the Pipeline laid. The habitats present, including arable land, grassland, scrub and trees, would be reinstated following installation of the Pipeline, and would be restored to match pre-existing habitats as closely as possible. Where the Pipeline runs parallel to a species-rich hedgerow with trees, which borders the arable field adjacent to the former Eye Airfield runway, root protection zones will be demarked within which construction activities will not be undertaken. This will help prevent damage to the root systems and soil compaction around the base of the trees.
- 4.4.19 Construction activities could also result in disturbance / displacement of species including brown hares, foraging and commuting bats, breeding birds, wintering birds and great crested newts.
- 4.4.20 A variety of measures would be used to avoid, minimise and mitigate impacts. These include embedded measures within the design of the

Project, such as altering the layout to reduce the impact on ecological receptors, as well as the successful implementation of an agreed Construction Environmental Management Plan, which would include pollution control measures. In addition, the landscaping strategy will incorporate significant hedgerow and woodland habitat planting which will provide a net gain in habitat quality, and will also improve the green infrastructure (habitat connectivity) across the arable landscape.

- 4.4.21 If great crested newts are found to be present during further survey work, a European Protected Species Mitigation Licence application will be produced and submitted to Natural England for consideration. Mitigation embedded in the landscaping proposals follows Natural England Great Crested Newt guidance. Further discussions with Natural England would take place in the event that Great Crested Newt presence is confirmed in future surveys.
- 4.4.22 Following the implementation of mitigation, no significant adverse effects on ecological receptors are predicted during construction of the Gas Connection.

#### Operation

- 4.4.23 The AGI would be situated within 50 m of a species-poor hedgerow with trees, however this habitat is not considered to be sensitive to any indirect operational impacts (such as increased traffic, noise, vibration, lighting) and, as such, operational effects to this ecological receptor are considered to be negligible and not significant.
- 4.4.24 Lighting at the AGI will introduce new lighting into a predominantly arable landscape potentially affecting brown hares, foraging and commuting bats, breeding birds and wintering birds. The lighting scheme for the Above Ground Installation will ensure minimal light spillage and directional lighting therefore ensuring that compensatory habitat is not lit and suitable for use as nesting, commuting and refuge for wildlife. Following appropriate mitigation, impacts are not expected to lead to significant adverse effects on ecological receptors.
- 4.4.25 It is anticipated that there would be no other impacts on ecology from operation of the Gas Connection.

#### Decommissioning

- 4.4.26 Any decommissioning work associated with the AGI is likely to result in similar impacts to those predicted during construction as the construction and decommissioning phases would involve similar activities. The Pipeline would most likely be left in-situ.

*Electrical Connection*

Construction

- 4.4.27 During construction of the Electrical Connection, potential impacts on ecological receptors could occur from habitat loss or disturbance, increased noise and vibration, increased dust, or accidental release of water-borne pollutants.
- 4.4.28 In order to create the A140 Junction for the Access Road there is potential for fragmentation of hedgerows and loss of small sections of hedgerow. A total of 254.6 m of hedgerow within the Electrical Connection Compound Site will be lost during the construction phase. A further 10 m of hedgerow will be lost along the Old Norwich Road to construct the Access Road. To mitigate for these impacts, the landscaping strategy for the Project will incorporate significant hedgerow and woodland habitat planting which will provide a net gain in habitat quantity and quality, and will also improve the green infrastructure (habitat connectivity) across the arable landscape. In addition, to avoid further habitat loss or fragmentation to hedgerows, Horizontal Directional Drilling will be used to install the Cable underneath the hedgerow to the south of Yaxley Lake.
- 4.4.29 Construction activities could also result in disturbance / displacement of species including brown hares, foraging and commuting bats, breeding birds, wintering birds and great crested newts.
- 4.4.30 Impacts would be minimised through embedded measures within the design of the Project, such as altering the layout to reduce the impact on ecological receptors, as well as the successful implementation of an agreed Construction Environmental Management Plan. In addition, the landscaping strategy will incorporate significant hedgerow and woodland habitat planting which will provide a net gain in habitat quality, and will also improve the green infrastructure (habitat connectivity) across the arable landscape.
- 4.4.31 If great crested newts are found to be present during further survey work, a European Protected Species Mitigation Licence application will be produced and submitted to Natural England for consideration. . Mitigation embedded in the landscaping proposals follows Natural England Great Crested Newt guidance. Further discussions with Natural England would take place in the event that Great Crested Newt presence is confirmed in future surveys.

4.4.32 Given the above, following the implementation of mitigation, no significant adverse effects on ecological receptors are predicted during construction of the Electrical Connection.

Operation

4.4.33 The Access Road and A140 Junction would be installed immediately adjacent to Yaxley Lake to the west of the A140. Use of the Access Road and A140 Junction during operation could lead to the run-off of oils and other pollutants into the water body. The road drainage design will therefore not allow road drainage to enter Yaxley Lake.

4.4.34 Lighting at the Electrical Connection Compound would introduce new lighting into a predominantly arable landscape potentially affecting brown hares, foraging and commuting bats, breeding birds and wintering birds. The lighting scheme for the Electrical Connection Compound will ensure minimal light spillage and directional lighting therefore ensuring that compensatory habitat is not lit and suitable for use as nesting, commuting and refuge for wildlife. Following appropriate mitigation, impacts are not expected to lead to significant adverse effects on ecological receptors.

4.4.35 The Electrical Connection Compound is located approximately 50 m from a water body which may be suitable for great crested newts. The Project drainage will be designed so that there is no risk of run-off or contamination into surrounding water bodies or other habitats, thereby avoiding any adverse impacts.

4.4.36 It is anticipated that there would be no other impacts on ecology from operation of the Electrical Connection.

Decommissioning

4.4.37 Any decommissioning work associated with the Electrical Connection is likely to result in similar impacts to those predicted during construction as the construction and decommissioning phases would involve similar activities. The Cable would most likely be left in-situ.

Cumulative Impacts

4.4.38 No adverse significant residual effects have been identified as a result of the construction or operation of the Project, and as such it follows that there will be no cumulative effects in combination with other projects in the vicinity, namely the overhead line diversion works and Triodos Renewables and Wind Power Renewables Ltd. Wind Farms.

### Residual Impacts

- 4.4.39 There are potential impacts to ecological receptors during construction, operation and decommissioning of the Project. Where significant adverse effects are anticipated appropriate mitigation has been identified, thereby ensuring no significant net loss of ecological habitats and no significant detrimental effects to any of the protected species populations. Residual effects for ecological receptors are therefore considered to be either not significant or to deliver positive effects.

## **4.5 Water Quality and Resources**

### Introduction

- 4.5.1 The construction, operation and decommissioning of the Project have the potential to impact upon local water quality and water resources. Although the Power Generation Plant would utilise air cooling, substantially reducing the need for water during operation, limited amounts of water would still be required for processes such as turbine blade cleaning.
- 4.5.2 A desk based assessment and site visit has been carried out in order to identify all surface water bodies within the vicinity of the Project Site, as well as any areas of vulnerability and previous pollution incidents which may have impacted on water bodies.
- 4.5.3 The full assessment for this topic is provided in Section 9 of the ES and a separate Flood Risk Assessment has been prepared (Document Reference 5.4). A brief summary is provided below.

### Baseline

- 4.5.4 The main water bodies within the vicinity of the Project Site are considered to be (see Figure 9.1(Document Reference 6.3):
- River Dove, the closest Main River to the Project, which flows from southwest to northeast, approximately 2 km east of the Power Generation Plant Site;
  - Unnamed culverted watercourse to the north of the Power Generation Plant Site;
  - Castleton Way Highway Drain, located immediately south of the Gas Connection Route Corridor and approximately 280 m west of the AGI;

- Water body 2 - A140 Drain (east side), located approximately 695 m south west of the Power Generation Plant Site running intermittently along the field boundary to the east of the A140;
- Water body 3 – Yaxley Lake, located approximately 665 m south west of the Power Generation Plant Site;
- Water body 4 – Small pond south of Yaxley Lake, located immediately south of the Electrical Connection Route Corridor;
- Water body 5 – Field drain, located approximately 15 m south of the Electrical Connection Route Corridor, running along a field boundary to the south of Yaxley Lake;
- Water body 6 – Small pond within agricultural fields, located approximately 50 m south of the Electrical Connection Route Corridor and approximately 260 m west of the A140;
- Water body 7 - Channel north of The Leys, located approximately 50m north west of the Electrical Connection Compound, originating from field drains through agricultural fields.

4.5.5 The bedrock of the Project Site is classified as a Principal Aquifer, which provides water for agricultural and industrial use. The Project Site also falls within a Groundwater Source Protection Zone, which denotes an aquifer that is used for public potable water supply. Activities within the Source Protection Zone are controlled by the Environment Agency to reduce contaminations risks.

#### Assessment of Potential Impacts

##### *Power Generation Plant*

##### Construction

4.5.6 A small amount of water would be required each day for general construction works (e.g. wheel washing and dust suppression) and hygiene. It is likely that this water will be brought in by bowser and therefore no surface water or groundwater abstraction will be required. In addition, in order to avoid the need for a local water supply, ready mixed concrete will be delivered to site. The impact of construction on water use from local sources will therefore be negligible.

4.5.7 The main potential impacts that may result from construction of the Power Generation Plant are the risk of contaminated material entering a surface water body through natural surface runoff from the Power Generation Plant Site. There are not anticipated to be any impacts on the water bodies listed above as the majority are located a significant distance from the Power Generation Plant Site and therefore will not be

directly impacted during construction. The potential to impact upon groundwater is also considered negligible. Best practice would be employed during construction to protect the water environment, in accordance with guidelines published by the Environment Agency.

#### Operation

- 4.5.8 The largest operational demand for water in the majority of UK power stations is cooling. However the Power Generation Plant will be air cooled therefore water use on-site will be limited to NOx control, potable water for drinking and sanitation purposes and plant washing. If water is required for NOx control a considerable amount of water would be required and it is not considered appropriate to tanker such a quantity to the site. As such, a permanent water supply will be sought and agreed with the local water supplier (Essex and Suffolk Water). If such a supply cannot be guaranteed, Dry Low NOx gas turbine generators will be used to reduce the water requirement of the plant.
- 4.5.9 The Power Generation Plant Site will be equipped with a surface water drainage system and a sewerage system. The surface water drainage system will discharge into an attenuation pond in the north of the Power Generation Plant Site. Before reaching the main sewerage network the runoff will pass through oil interceptors. The impacts on water bodies from accidental spillages and leaks will therefore be negligible.
- 4.5.10 The Project will lead to an increase in the amount of runoff from within the Power Generation Plant Site boundary due to the increase in hardstanding. However this additional runoff will be captured by the surface water drainage system so that there is no impact on the surrounding land.

Based on the assessment, following the implementation of mitigation, it is predicted that there would be a negligible impact on water quality and resources during operation of the Power Generation Plant.

#### Decommissioning

- 4.5.11 During decommissioning, similar impacts to those predicted during construction may be experienced.

#### *Gas Connection*

#### Construction

- 4.5.12 The Gas Connection is located within close proximity to two water bodies, which could be at risk due to potential contamination of surface

water runoff. Best practice would, however, be followed and an agreed Construction Environmental Management Plan implemented.

4.5.13 Prior to operation, the Pipeline will be tested by closing off the ends, filling it with water and increasing the pressure to a pre-determined level higher than the pressure at which it is designed to operate. The water used for this operation would likely be tankered to and from site, from where it will be disposed at a suitable disposal facility.

4.5.14 It is therefore considered that construction of the Gas Connection will have negligible impacts on water quality and water resources in the area.

#### Operation

4.5.15 During operation, there would be negligible impacts on water quality and resources from the operation of the Gas Connection.

#### Decommissioning

4.5.16 During decommissioning, it is likely that the AGI will be removed. As such, similar impacts to those predicted during construction may be experienced.

#### *Electrical Connection*

##### Construction

4.5.17 Installation of the Cable requires the crossing of two surface water bodies, however these will be crossed using Horizontal Directional Drilling in order to ensure that there is no interaction between the water body and the construction works.

4.5.18 The Access Road will also cross one water body; water body 4, the small pond south of Yaxley Lake and lies in close proximity to water body 3, Yaxley Lake. The Access Road may therefore cause a reduction in the overall extent of water body 4 resulting in a minor impact, although this is not considered significant. In addition, Yaxley Lake could be at risk due to potential contamination of surface water runoff. Best practice would, however, be followed including the implementation of an approved Construction Environmental Management Plan resulting in a negligible impact.

4.5.19 The construction of the Electrical Connection Compound will require a number of activities similar to those described for the construction of the Power Generation Plant, including large excavations, but would not result in any significant effects on water quality or resources.



#### Operation

4.5.20 During operation, the impact on water resources arising from the operation of the Electrical Connection is considered to be negligible as the Cable will be buried and water usage at the Electrical Connection Compound is expected to be minimal.

4.5.21 The Access Road along the Electrical Connection Route Corridor will result in the generation of additional surface water runoff. However, this is likely to be minimal and would be controlled with an appropriately designed drainage system. In addition, as the Access Road would impinge on the north edge of water body 4 there is the potential for spillages or dust generation from vehicle movements along the Access Road to impact on this water body. Given the low value of water body 4 it is likely that such impacts would have a slight adverse impact upon the water body.

#### Decommissioning

4.5.22 During decommissioning, similar impacts to those predicted during construction may be experienced.

#### Cumulative Impacts

4.5.23 There is the potential for cumulative construction impacts with the Project during the diversion of the existing overhead line in the vicinity of Electrical Connection Compound. These impacts would be as a result of the movement of construction vehicles along the line of the overhead line in the vicinity of the Electrical Connection Compound Site. However, provided best practice is followed no significant impacts are predicted.

#### Residual Impacts

4.5.24 Based on the results of the environmental assessment, taking into account potential mitigation measures, construction, operation and decommissioning of the Project will not result in any likely significant effects on water quality or water resources.

## **4.6 Geology, Ground Conditions and Agriculture**

### Introduction

4.6.1 The construction, operation and decommissioning of the Project has the potential to impact upon geology, ground conditions and agriculture. The Project also has the potential to result in impacts from

contamination (existing or created) on human health and sensitive ecological receptors.

- 4.6.2 A desk based assessment has been carried out to assess the baseline geology and ground conditions underlying the Project Site. The assessment studied information regarding previous land uses of the Project Site and the surrounding area, the soils and geology present at the Project Site and any potential contamination issues resulting from former site uses, including unexploded ordnance.
- 4.6.3 A Conceptual Site Model approach has been used to assess the risk posed by contaminants on human health and other sensitive receptors. This examines the potential sources of contamination (e.g. historical sources), the potential receptors that could be affected (e.g. soil and construction workers) and the pathways to these receptors (e.g. leaching in surface water and inhalation of airborne contaminants).
- 4.6.4 The full assessment for this topic is provided in Section 10 of the ES. A brief summary is provided below.

#### Baseline

- 4.6.5 Ground conditions across the Project Site comprise Chalk overlain unconformably by the sands of the Crag Formation and drift deposits of Lowestoft Glacial Till. The drift deposits are classed as unproductive strata, likely due to the high clay content. These are geological strata with low permeability that have negligible significance for water supply or river base flow. The soils at the Project Site are therefore likely to be moderately to poorly drained.
- 4.6.6 The Project Site overlies a Principal Aquifer. The nearest active groundwater abstraction to the Project Site is located approximately 480 m south and is listed for general farming and domestic / agriculture (general) use and is sourced from the Chalk Aquifer. Although this is a sensitive receptor it is considered likely to be up hydraulic gradient of the Project Site.
- 4.6.7 The desk based assessment has identified that historical / registered landfills, licensed waste management facilities and waste treatment or disposal sites are not considered to present significant risks of ground contamination due to their distance (at least 300 m) and location down regional hydraulic gradient of the Project Site.
- 4.6.8 Due the Project Site's former use as an airfield during World War 2 a specialist unexploded ordnance desk study has been undertaken. The results of the study classify the majority of the Project Site as low risk

for unexploded ordnance, although part of the Gas Connection is classified as moderate risk as this area was reportedly used for a bomb dump when the former Eye Airfield was operational.

- 4.6.9 The Project Site has moderate agricultural value, although it is considered unlikely to be classified as 'best and most versatile land'.

Assessment of Potential Impacts

*Power Generation Plant*

Construction

- 4.6.10 During construction of the Power Generation Plant, the main potential impacts on geology, ground conditions and agricultural would be from:

- Disturbance of existing contamination and creation of pollution pathways;
- Disturbance to or loss of deposits of geology, soils and agricultural land; and
- Creation of pollution incidents from e.g. spillages.

- 4.6.11 At the pre-construction stage a geoenvironmental site investigation would be conducted across the Project Site to confirm the baseline conditions. During construction stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Construction Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on construction workers, surrounding land uses, controlled waters (Principal Aquifer and surface water bodies) and the built environment are expected to be negligible and not significant.

- 4.6.12 The construction of the Power Generation Plant will result in loss of approximately 5.37 ha of moderate agricultural value land, with an additional 2.28 ha of land, directly south of the Power Generation Plant, used during construction for the construction and maintenance compound. This is considered to be a significant adverse impact, however, this area of land has been designated as a Strategic Site for development by Mid Suffolk District Council and is likely to be lost to some form of development in the near future. In addition, as part of the embedded design mitigation, land take has been minimised wherever possible.

Operation

4.6.13 During operation there are anticipated to be negligible impacts to end users (site workers) from contaminated soils as the Power Generation Plant Site would be predominantly covered with hardstanding with limited areas of softstanding. There will also be negligible impacts to off-site human receptors due to reduced dust production compared with the current baseline. No other impacts on geology and ground conditions are anticipated.

4.6.14 The loss of 5.37 ha of moderate agricultural value land for the operational life of the Power Generation Plant is considered to be a significant adverse impact.

#### Decommissioning

4.6.15 During decommissioning, stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on decommissioning workers, surrounding land uses and controlled waters (Principal Aquifer and surface water bodies) are expected to be negligible and not significant.

4.6.16 Any future land use will be determined by planning policy at the time and therefore any impact to agricultural land cannot be determined at this time.

#### *Gas Connection*

#### Construction

4.6.17 During the excavation process there is risk associated with the possibility of unidentified unexploded ordnance buried below ground in the eastern part of the Gas Connection Site. This will be managed via the use of Explosive Ordnance Clearance operatives during both the geoenvironmental investigation and construction phases, as required.

4.6.18 During construction stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Construction Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on construction workers, surrounding land uses, controlled waters (Principal Aquifer and surface water bodies) and the built environment are expected to be negligible and not significant.

4.6.19 The Gas Connection Route Corridor, together with the land for the AGI will be removed from agricultural use for the duration of the

construction phase. The total area of land is approximately 6.15 ha. This is considered to be a significant local adverse impact.

#### Operation

4.6.20 During operation of the Gas Connection there are anticipated to be negligible effects on end users (site workers) with limited or no exposure to ground contamination. No other impacts on geology and ground conditions are predicted.

4.6.21 The agricultural land within the Gas Connection Route Corridor would be reinstated and would be able to be farmed normally. The site of the AGI (approximately 1.1 ha) would be lost for agricultural use. This is considered to be a significant adverse impact.

#### Decommissioning

4.6.22 Decommissioning of the AGI may result in exposure to contaminants in soil (dermal, oral, inhalation of dust), although this is likely to be limited as the service corridors etc. will be backfilled with inert backfill and exposure will be mitigated through the implementation of industry standard best practice. Stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on decommissioning workers, surrounding land uses and controlled waters (Principal Aquifer and surface water bodies) are expected to be negligible and not significant.

4.6.23 Any future land use will be determined by planning policy at the time and therefore any impact to agricultural land cannot be determined at this time.

#### *Electrical Connection*

#### Construction

4.6.24 During construction stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Construction Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on construction workers, surrounding land uses, controlled waters (Principal Aquifer and surface water bodies) and the built environment are expected to be negligible and not significant.

- 4.6.25 The construction of the Electrical Connection will result in loss of approximately 11.53 ha of moderate agricultural value land. This is considered to be a significant adverse impact. This area may be reduced by up to approximately 0.50 ha if a gas insulated substation is constructed, as opposed to an air insulated substation.

#### Operation

- 4.6.26 During operation of the Electrical Connection there are anticipated to be negligible effects on end users (site workers) with limited or no exposure to ground contamination. No other impacts on geology and ground conditions are predicted.

- 4.6.27 The agricultural land within the Electrical Connection Route Corridor would be reinstated and be able to be farmed normally. A total of 7.51 ha of agricultural land will, however, be lost in the Access Road Site, A140 Junction Site and Electrical Connection Compound Site. This is considered to be a significant adverse impact. This area may be reduced by up to approximately 0.50 ha if a gas insulated substation is constructed, as opposed to an air insulated substation.

#### Decommissioning

- 4.6.28 Decommissioning of the Electrical Connection Compound may result in exposure to contaminants in soil (dermal, oral, inhalation of dust), although this is likely to be limited as the service corridors etc. will be backfilled with inert backfill and exposure will be mitigated through the implementation of industry standard best practice. Stringent mitigation measures such as working within best practice guidelines and adhering to a detailed Environmental Management Plan will be employed to prevent any contamination or pollution incidents. As such, effects on decommissioning workers, surrounding land uses and controlled waters (Principal Aquifer and surface water bodies) are expected to be negligible and not significant.

- 4.6.29 Any future land use will be determined by planning policy at the time and therefore any impact to agricultural land cannot be determined at this time.

#### Cumulative Impacts

- 4.6.30 There is the potential for cumulative construction impacts with the Project during the diversion of the existing overhead line in the vicinity of Electrical Connection Compound. An estimate of the additional agricultural land loss during construction and operation is undetermined

at this stage, although effects during construction and operation are considered to be large.

#### Residual Impacts

- 4.6.31 Based on the results of the environmental assessment, taking into account potential mitigation measures, construction, operation and decommissioning of the Project is predicted to result in a residual slight adverse impact on geology and ground conditions. The residual impact on agriculture, however, during construction and operation of the Project is anticipated to be large on a local scale as a result of the loss of agricultural land.

## 4.7 Landscape and Visual Impacts

### Introduction

- 4.7.1 The construction, operation and decommissioning of the Project has the potential to impact upon the landscape character and visual amenity of the area.
- 4.7.2 A desk based assessment and site visit along with compilation of photomontages have been undertaken to determine the baseline landscape character of the area and the sensitive receptors which may be impacted by the Project in a 15 km study area. Areas with potential views of the Project have been defined through site survey, the extent of which have been shown on Zone of Theoretical Visibility maps.
- 4.7.3 The full assessment for this topic is provided in Section 11 of the ES. A brief summary is provided below.

### Baseline

- 4.7.4 The area in the immediate vicinity of the Power Generation Plant Site and Gas Connection Site comprises medium to large scale industrial development within the former Eye Airfield (Eye Airfield Industrial Estate and Mid Suffolk Business Park), and is surrounded by semi-rural landscape that includes arable farmland, the A140 major transport route, prominent pylons and an overhead transmission line, and small villages / farmsteads. Mature tree belts and hedgerows within the former Eye Airfield reduce views of existing industrial development.
- 4.7.5 The Electrical Connection would be sited within agricultural land characterised by a strong, historic field pattern, comprising small to medium scale rectangular fields enclosed by hedgerows and small copses. The topography of the surrounding area is generally flat which,

in combination with existing field hedges and woodland, limits views of the site.

- 4.7.6 There are no nationally designated landscapes within the 15 km study area, although two locally important Special Landscape Areas, designated by Mid Suffolk District Council, are located within the study area: River Dove, which runs south-west to north-east on the eastern side of the study area and River Waveney which runs west to east across the northern part of the study area.
- 4.7.7 A well developed network of Public Rights of Way also lies within the inner part of the study area.

#### Assessment of Potential Impacts

##### *Power Generation Plant*

##### Construction

- 4.7.8 The main potential sources of landscape and visual impacts during construction of the Power Generation Plant are: site clearance works, earthworks, vegetation removal, construction traffic and construction lighting. The construction compounds and activities would temporarily disturb an area of agricultural land, which would be reinstated on completion of the works. There will be a loss of agricultural land within the footprint of the built development. Tall structures, such as the construction cranes and the upper portions of the stacks, would be seen in the context of other taller, more prominent vertical industrial structures within the former Eye Airfield. These include the 130 m high wind turbines, ~50 m high National Grid Gas Compressor Station mast and 40 m high Eye Power Station stack. It is therefore predicted that during construction there would be a short term moderate adverse impact to the landscape and a short term moderate adverse visual impact from two viewpoints to the south of the Power Generation Plant.

##### Operation

- 4.7.9 During operation, impacts on landscape and visual amenity will result from introduction of permanent structures, particularly the stacks of the Power Generation Plant, which would be the largest structure on the Power Generation Plant Site. Agricultural land would be lost permanently from the Power Generation Plant Site and replaced by built elements and hard surfacing.
- 4.7.10 Woodland planting associated with the National Grid Gas Compressor Station and other existing structures will largely screen the Power



Generation Plant from the north, north-east and north-west. There will, however, be an indirect effect on the landscape character of areas to the south and south-east of the Power Generation Plant Site from where views of the Power Generation Plant would be available. The areas include sections of public footpaths and residential development on the north western edge of Eye in particular.

4.7.11 As part of the iterative design process for the Project, primary mitigation relating to the design has been developed with reference to potential effects. Where specific residual adverse effects of the Project cannot be designed out, mitigation in the form of landscaping and planting has been developed. Mitigation planting has been developed to fulfil landscape and ecological objectives and to enhance landscape and biodiversity where possible.

4.7.12 Localised effects arising from the Power Generation Plant would be of moderate significance at commissioning when mitigation planting would have some visual impact but would not provide an effective screen. At maturity (around 15 years after planting), the planting would integrate with adjacent woodland planting surrounding the National Grid Gas Compressor Station and Eye Power Station to provide a significant woodland belt. It would screen the smaller structures and ground level activities leaving only the upper elevation of the turbines and stacks visible.

4.7.13 The residual landscape and visual impact during operation of the Power Generation Plant is therefore not predicted to be significant and there would be a minor beneficial impact from mitigation woodland / hedgerow screen planting.

#### Decommissioning

4.7.14 During decommissioning, temporary activities likely to affect landscape and visual receptors would take place over a period of several months, similar to those described for construction. Landscape restoration and management plans would be submitted for agreement with Mid Suffolk District Council prior to commencement of any demolition works. The landscape and visual impact is predicted to be negligible and not significant.

4.7.15 *Gas Connection*

#### Construction

4.7.16 Sources of impact during construction would be similar to those described above in relation to the Power Generation Plant. However,

the visual impact of the construction works would be more prominent due to the close proximity with Castleton Way and the settlement of Yaxley.

- 4.7.17 The construction works would be sited within open, rural landscape that is visually sensitive to change of this nature. Approximately 0.32 ha of agricultural land would be temporarily displaced in order to construct the Pipeline and to accommodate the construction works. Removal of hedgerows and trees to construct the Pipeline would have a direct effect on landscape elements and National Grid planting constraints in the vicinity of the Pipeline may prevent their reinstatement. There would also be a permanent displacement of approximately 0.2 ha agricultural land for the AGI and mitigation planting.
- 4.7.18 It is therefore predicted that during construction of the Gas Connection there would be a short term moderate adverse impact to the landscape and a short term large adverse visual impact from one viewpoint to the south (Hall Farm, Public Right of Way, Yaxley), due to combined impacts with the Power Generation Plant.
- 4.7.19 Operation
- 4.7.20 During operation, long term landscape and visual impacts would arise from the AGI. The introduction of the proposed industrial structures up to 3 m high, perimeter security fencing and hard surfacing will add man-made elements to a rural, agricultural landscape where no similar structures currently exist.
- 4.7.21 The AGI would be visible from the wider landscape to the south. Extensive structure planting will be undertaken on all boundaries, along with new hedgerow planting adjacent to Castleton Way and Potash Lane. The proposed rectangular block of screen planting around the AGI would, however, be uncharacteristic of the surrounding vegetation pattern until it integrated with adjoining new hedgerow planting on Castleton Way and Potash Lane.
- 4.7.22 In the longer term, when mitigation planting had established (after approximately 5 - 7 years), views of the AGI would be screened from nearby receptors, including residents at the edges of settlements located south, south-west and south-east of the Project Site at Yaxley and Eye.
- 4.7.23 It is therefore predicted that during operation of the Gas Connection there would be a moderate adverse impact on the landscape, with a localised effect up to 1 km, reducing to a slight adverse impact after 5 – 7 years when mitigation planting had established. There would also be

a moderate adverse visual impact from the viewpoint to the south (Hall Farm, Public Right of Way, Yaxley), but again this impact would be reduced when mitigation planting had established. The mitigation screen planting would result in a minor beneficial impact. The residual impact is therefore considered to be slight adverse and not significant.

#### Decommissioning

4.7.24 During decommissioning, temporary activities likely to affect landscape and visual receptors would take place over a period of several months, similar to those described for construction. Landscape restoration and management plans would be submitted for agreement with Mid Suffolk District Council prior to commencement of any demolition works. The residual impact is predicted to be moderate adverse, short term and not significant.

#### 4.7.25 *Electrical Connection*

##### Construction

4.7.26 During construction, potential adverse temporary landscape and visual impacts would arise from activities including the removal of hedgerows, topsoil and subsoil stripping from agricultural land, earthworks, construction traffic and construction lighting. Construction plant and activities would be distinguishable over intervening vegetation, causing a change in the composition of the existing view, which is characterised by the existing overhead high voltage line. There would be a loss of agricultural land within the footprint of the Electrical Connection Compound and Access Road. Agricultural land would also be temporarily displaced in order to construct the Cable and to accommodate the construction works, although this land would subsequently reinstated. Trees and hedgerows would be removed where 'trenchless' construction is impractical in the vicinity of the new A140 Junction. It is therefore predicted that during construction of the Electrical Connection there would be a short term slight adverse impact on the landscape and a moderate adverse and short term visual impact.

##### Operation

4.7.27 During operation, long term landscape and visual impacts would arise from the Electrical Connection Compound, Access Road and A140 Junction. The Access Road would, however, be designed to resemble a farm track and all land adjacent to the Access Road would be returned to agriculture following construction. Depending on the Substation design, an air insulated substation would be more extensive

than a gas insulated substation and the structures would be visible through the security fence. The footprint of a gas insulated substation would be significantly smaller and the majority of the industrial structures would be sited within buildings.

- 4.7.28 Increased industrial development associated with the Electrical Connection Compound and Access Road, and the corresponding loss of small scale arable farmland, would form a permanent noticeable change in the composition of near distance views from residential properties in Yaxley to the south and the surrounding network of Public Rights of Way and permissive paths. The visual impact would be reduced if a gas insulated substation is used. These receptors, which have a high sensitivity to change of this nature, would experience long term moderate adverse visual impacts until mitigation planting matured and screened the industrial structures. This is anticipated to occur after approximately 15 years.
- 4.7.29 The orientation of the Electrical Connection Compound diagonally to the small-scale rectangular fields would also sever the pattern of landscape, although it would gradually re-establish as mitigation screen planting matured.
- 4.7.30 It is therefore predicted that during operation of the Electrical Connection there would be a slight adverse impact on the landscape and a moderate adverse visual impact until mitigation planting is effective. The mitigation screen planting would result in a minor beneficial impact. The residual impact is therefore considered to be moderate adverse, medium term and significant.

#### Decommissioning

- 4.7.31 During decommissioning, temporary activities likely to affect landscape and visual receptors would take place over a period of several months, similar to those described for construction. Landscape restoration and management plans would be submitted for agreement with Mid Suffolk District Council prior to commencement of any demolition works. The residual impact is predicted to be moderate adverse, short term and not significant.

#### Cumulative Impacts

- 4.7.32 Potential cumulative impacts will arise from requirement to construct a new connection between the existing overhead electrical transmission lines and the new Electrical Connection Compound. The new connection would be designed, constructed and operated by National Grid. Short term significant cumulative visual effects would be

generated by the new connection in combination with the proposed Electrical Connection Compound during construction. No significant cumulative visual effects would be generated by the new connection in combination with the proposed Electrical Connection Compound during operation. The assessed significance of residual impacts at operation would remain as identified for the proposed Electrical Connection Compound (i.e. slight adverse impact on the landscape and a moderate adverse visual impact until mitigation planting is effective).

#### Residual Impacts

- 4.7.33 Based on the results of the environmental assessment, taking into account potential mitigation measures, it is considered that potential residual landscape and visual effects would be localised due to the industrial character of the area surrounding the proposed Project, and by the extensive network of hedgerows and woodland within the vicinity of the Project Site. There would, however, be moderate adverse, short to medium term, significant impacts associated with the operation of the Project, primarily associated with the AGI and Electrical Connection Compound given their rural location, until mitigation planting is effective.

## **4.8 Traffic, Transport and Access**

### Introduction

- 4.8.1 The construction, operation and decommissioning of the Project have the potential to impact upon the local transport network, through the generation of additional traffic movements to the area.
- 4.8.2 Baseline traffic data was collected in October 2013 and the number of additional traffic movements generated during construction, operation and decommissioning of the Project and how these may impact on traffic infrastructure and safety have been assessed. Other developments, such as nearby residential developments, have been accounted for by applying traffic growth factors.
- 4.8.3 The full assessment for this topic is provided in Section 12 of the ES. A brief summary is provided below.

### Baseline

- 4.8.4 The Power Generation Plant Site would be accessed from the existing road network via Castleton Way (an unrestricted country road) via an existing junction to the former main runway. Castleton Way provides access to the B1077 to the east and the A140 to the west. The A140, which runs north-south linking Ipswich and Norwich, is a major

transport route from which the national road network is easily accessible. For all life cycle phases of the proposed Project, it is proposed that access to / from Castleton Way would be mainly via the A140.

- 4.8.5 Access to the AGI will be taken via the Power Generation Site Compound Area and therefore access to this will be taken from Castleton Way.
- 4.8.6 Access to the Electrical Connection Compound Site is proposed via a new junction, the A140 Junction, consisting of a priority T-junction with the A140 at the location of the stopped-up Old Norwich Road, north of Castleton Way junction.
- 4.8.7 A footpath runs from Victoria Hill (B1077) on the east of the Project Site to the A140 on the west. For part of the route, the footpath runs along the southern border of the Power Generation Plant Site, but then cuts through the Project Site when the footpath crosses the runway of the former airfield.

#### Assessment of Potential Impacts

##### *Power Generation Plant*

##### Construction

- 4.8.8 Due to the nature of traffic interactions, the profile of construction workers required for the Power Generation Plant has been combined with that for the Gas Connection and Electrical Connection. It is anticipated that a total of up to 127 workers would be required during the peak construction phase for the Project, which is forecast to occur in Quarter 5. With a construction start date of 2017, the peak construction phase would therefore occur in early 2018. The total construction period is estimated as being 21 months. Assuming an average car occupancy of 1.6, the AM (8.00am – 9.00am) and PM (5.00pm – 6.00pm) peak hours are each anticipated to generate around 41 vehicle trips to and from the Project Site.
- 4.8.9 A number of Heavy Goods Vehicles would also be required to deliver construction materials to the Power Generation Plant Site. There is therefore the potential to impact on the surrounding road network through for example, temporary road closures and requirement for escort vehicles. However, given the temporary nature of the construction phase, the impacts on traffic and transport are predicted to be minor. Calculations show that the peak in Heavy Goods Vehicles movements would occur during the first quarter of construction for the

Project, with an average of 74 vehicle trips per day being generated over a 3 month period. Over the 11 hour daily period for arrivals and departures, this equates to just under 7 inbound and 7 outbound trips per hour.

4.8.10 From testing of the 2013 baseline traffic data and the predicted 2018 traffic data, it is predicted that the Power Generation Plant will have no significant impact on the A140 corridor. Traffic travelling northbound and southbound will experience similar levels of delay to the 2013 base year during the construction period and overall traffic speed is unlikely to be affected. However, it is expected that effects will occur on the side roads at junctions with the A140. All junctions within the study area can cope with additional traffic with the exception of A140 / B1077 where Project traffic at the peak of construction contributes to increased delay on an already over saturated junction. No direct mitigation measure has been proposed as the construction traffic will only temporarily contribute to increased flow of only 1% on an already over saturated junction. A Traffic Management Plan will, however, be prepared to manage construction traffic and limit potential impacts. An Interim Construction Traffic Management Plan for the Project can be found in Appendix 12.D of the ES.

4.8.11 Throughout the construction phase of the Power Generation Plant, there may be temporary restrictions on use of the footpath that runs from Victoria Hill (B1077) on the east of the Project Site to the A140 on the west. Two other footpath routes are available across the airfield.

#### Operation

4.8.12 During operation of the Power Generation Plant, up to a maximum of 15 staff are anticipated to be employed full time. Occasional maintenance vehicles, deliveries and visitor access to the Power Generation Plant may also be required. It is anticipated that if a mains supply of water is not connected, then then minimal water tankering may be required to deliver water to site for the operation of the Power Generation plant. However, given the low volume of traffic generated during the operational phase, any impacts on the surrounding transport network will be negligible. Nonetheless, Travel Plan measures to encourage sustainable transport are set out within an Interim Construction Worker and Operational Worker Travel Plan for the Project, which can be found in Appendix 12.E (Document Reference No: 6.2).

#### Decommissioning

- 4.8.13 During decommissioning, similar impacts to those predicted during construction would be experienced.

*Gas Connection*

Construction

- 4.8.14 The number of construction workers required to construct the Gas Connection would be low in relation to the Power Generation Plant. As such, there is likely to be limited impacts associated with additional trips on the transport network. There would be some additional traffic caused by the arrival and departure of construction workers and Heavy Goods Vehicles delivering and removing goods from the Gas Connection Site, however, this is anticipated to be low.

- 4.8.15 Road works will be required for the routing of the Gas Connection across Potash Lane and access roads within the former Eye Airfield site. This will have a minor impact on surrounding road network. A Traffic Management Plan will be prepared to minimise any disruption.

Operation

- 4.8.16 Maintenance vehicles are expected to be infrequent and are not anticipated to cause any detriment to the local transport network.

Decommissioning

- 4.8.17 The decommissioning stage would generate very few vehicle movements, as it is likely that the Gas Connection would be left in situ. Some elements of the AGI may be removed, although there are not anticipated to be any impacts on the traffic network.

*Electrical Connection*

Construction

- 4.8.18 A new access from the A140 (the A140 Junction) has been proposed to allow safer and easier movement of construction traffic to the Electrical Connection Site. This will avoid the need for construction traffic to use routes in the village of Yaxley. The number of Heavy Goods Vehicles required for the construction of the Electrical Connection is anticipated to be low compared to the Power Generation Plant with less than 10 per day at the peak of construction activity. This is anticipated to have a minor impact on the surrounding road network.

- 4.8.19 There will, however, be temporary disruption to traffic on the A140 caused by the construction of the Access Road to the Electrical



Connection Compound. Works on the A140 would likely last approximately 4 weeks and may involve temporary (night time) full closure of the road. Temporary diversions routes would be agreed with Suffolk County Council prior to any works being carried out.

4.8.20 The Electrical Connection will cut across Leys Lane to the south of a bridleway. Access to the Leys will be maintained by way of providing temporary surfacing parallel to Leys Lane during construction of the Electrical Connection over Leys Lane. Alternatively, a diversion of the Public Right of Way could be taken via Judas Lane.

4.8.21 Allotments are located on the northern-most edge of Old Norwich Road and lie to the north of the proposed Electrical Connection Compound access track. Access to the allotments will be maintained by way of provision of the A140 Junction or through temporary surfacing on Old Norwich Road if construction of the A140 Junction is underway.

#### Operation

4.8.22 Maintenance access to the Electrical Connection Compound will be via the Access Road, which would connect to the A140 via the A140 Junction. Discussions will be held with Suffolk County Council to determine the ownership of the Access Road and accessibility by the public during operation. During operation, maintenance vehicles are, however, expected to be infrequent and would therefore have a negligible impact on surrounding road network.

#### Decommissioning

4.8.23 During decommissioning, similar impacts to those predicted during construction would be experienced.

#### Cumulative Impacts

4.8.24 It has been concluded that there will be no cumulative impacts from traffic from neighbouring developments to the Project.

#### Residual Impacts

4.8.25 Based on the results of the environmental assessment, taking into account potential mitigation measures, construction, operation and decommissioning of the Project will result in negligible or minor impacts on traffic, transport and access.

## 4.9 Cultural Heritage and Archaeology

### Introduction

- 4.9.1 The construction, operation and decommissioning of the Project has the potential to impact upon the setting and significance of Heritage Assets; both statutory designated such as Scheduled Monuments, Listed Buildings and Conservation Areas and other non-designated Heritage Assets.
- 4.9.2 An archaeological desk based assessment and site visit were carried out as part of the archaeological assessment which considered an inner study area (extending 1 km from the edge of the Project Site) and outer study area (extending 5 km from the centre of the Project Site). A geophysical survey was also carried within and around the Project Site in order to detect areas of archaeological potential.
- 4.9.3 The full assessment for this topic is provided in Section 13 of the ES. A brief summary is provided below.

Baseline

- 4.9.4 The desk based assessment identified a total of 48 Heritage Assets (excluding Listed Buildings) within the Project Site and inner study area. A total of 71 Listed Buildings were also recorded within the Project Site and inner study area (see Figure 13.2 (Document Reference No: 6.3).
- 4.9.5 Within the Power Generation Plant Site, only two Heritage Assets have been identified: Medieval field boundaries and the former Eye Airfield. A further Heritage Asset, a lane that follows the parish boundary between Eye and Yaxley, may continue across the Project Site.
- 4.9.6 Within the Electrical Connection Site are seven fields / field boundaries of potential Iron Age date. A further Heritage Asset is a Roman Road, part of which runs through the Access Road, the A140 Junction and the Electrical Connection Route Corridor. A collection of metalwork that is indicative of an Anglo-Saxon cemetery has been recovered from part of the Electrical Connection Route Corridor.
- 4.9.7 The results of the geophysical survey have indicated that there are three main areas (Plots A, B and C) of potential archaeological evidence within and around the Project Site:
- Within Plot A located outside of the Project Site to the north of The Leys, is an eroded enclosure, which has been interpreted as a structure of possible Romano-British date. An east/west aligned ditch runs across the field, which may represent the remains of an ancient enclosure or field system or could be a more recent ditch or drain. Of interest, is a curvilinear ditch, which could be part of an

archaeological feature, such as an enclosure of Iron Age/Romano-British date;

- Plot B, located outside the Project Site, to the west of the A140 and south of the Access Road, shows anomalies that have been interpreted as an infilled pond, along with more recent drains and ditches;
- Plot C, located to the south of the former Eye Airfield, within the Gas Connection Site, shows a weak curvilinear anomaly that may be archaeological in nature.

#### 4.9.8 Assessment of Potential Impacts

##### *Power Generation Plant*

##### Construction

- 4.9.9 The excavation of foundations for the Power Generation Plant along with its ancillary structures, all have the potential to impact directly on buried archaeology, both known and unknown.
- 4.9.10 Two Heritage Assets are located within the Power Generation Plant Site and would be directly impacted by the construction of the Power Generation Plant. A third Heritage Asset, a lane that may continue into the Power Generation Plant, could also be directly impacted. In addition, there is high potential for buried archaeology within the Power Generation Plant Site due to the presence of known archaeology, such as findspots. It is anticipated therefore that construction of the Power Generation Plant would result in substantial adverse effects on non-designated Heritage Assets, which is significant. The proposed mitigation in relation to known sites will be to preserve by record. This will most likely take the form of targeted trial trenches within the Project Site. A contingency for further excavation work has been presented in the Written Scheme of Investigation, which can be found in Appendix 13.C of the ES.
- 4.9.11 The direct impact on the setting of the non-designated Heritage Assets within the Power Generation Plant Site during construction is considered to be of negligible magnitude and not significant. In addition, some of the designated Heritage Assets within the outer study area will have a direct line of sight to the construction of the Power Generation Plant. There would be a negligible or slight effect in the setting for these Heritage Assets, although this is not considered to be a significant impact.

#### Operation

- 4.9.12 Once the Power Generation Plant is operational, the main potential impacts are likely to be the disruption of the setting and appreciation of Heritage Assets, particularly Scheduled Monuments and tall Listed Buildings, such as churches. None of these impacts are, however, considered likely to be significant. It is envisaged that mitigation measures, such as hoardings or barriers are likely to cause more adverse visual impacts than if only the Power Generation Plant were present, therefore, no mitigation measures are proposed.

#### Decommissioning

- 4.9.13 During the decommissioning of the Power Generation Plant, it is not anticipated that there will be any additional impacts other than those mentioned for construction.

#### *Gas Connection*

#### Construction

- 4.9.14 The excavation of the Gas Connection Route Corridor and the AGI has the potential to impact directly on buried archaeology, both known and unknown. There are, however, no known Heritage Assets within the Gas Connection Site.
- 4.9.15 The direct impact on the setting of the non-designated Heritage Assets within the Gas Connection Site during construction is considered to be of negligible magnitude and not significant. In addition, some of the designated Heritage Assets within the outer study area will have a direct line of sight to the construction of the Gas Connection. There would be a negligible or slight effect in the setting for these Heritage Assets, although this is not considered to be a significant impact.

#### Operation

- 4.9.16 During the operational phase, the main potential impacts are likely to be the disruption of the setting and appreciation of the Heritage Assets as a result of the AGI, however these impacts are not considered likely to be significant.

#### Decommissioning

- 4.9.17 During the decommissioning phase, it is not anticipated that there will be any additional impacts other than those mentioned for construction.

#### *Electrical Connection*

## Construction

- 4.9.18 The excavation of the Electrical Connection Route Corridor and the foundations for the Electrical Connection Compound, as well as the Access Road and A140 Junction, has the potential to impact directly on buried archaeology, both known and unknown. Several findspots have been recovered from the vicinity of the Electrical Connection Route Corridor highlighting its high archaeological potential.
- 4.9.19 Within the Electrical Connection Compound lies an ancient field system comprising seven fields / field boundaries of potential Iron Age date. In the event that the Electrical Connection Compound is comprised of an air insulated substation, all seven field boundaries will be impacted upon. However, if a gas insulated substation is constructed, only one existing field boundary and one historic field boundary will be affected. In addition to this Heritage Asset, a collection of metalwork finds indicative of an Anglo-Saxon cemetery, would also be directly impacted upon by the construction of the Electrical Connection Compound. The significance of both of these assets is uncertain at this stage in the Project as they have not been fully investigated. As such, they are considered to have regional significance and it is preferred that these assets are retained *in situ*. However, if this is unavoidable, then a programme of mitigation is recommended comprising a topographic survey of any extant earthworks followed by trial trenching.
- 4.9.20 A Roman Road will also be directly impacted upon by the construction of the Electrical Connection Route Corridor resulting in substantial adverse effects on this non-designated Heritage Asset. As with the Power Generation Plant Site, the proposed mitigation in relation to known sites will be to preserve by record. This will most likely take the form of targeted trial trenches within the Project Site. A contingency for further excavation work has been presented in the Written Scheme of Investigation (Appendix 14.C of the ES (Document Reference No: 6.2, Vol I)).
- 4.9.21 The direct impact on the setting of the non-designated Heritage Assets within the Electrical Connection Site during construction is considered to be minor and not significant. In addition, some of the designated Heritage Assets within the outer study area will have a direct line of sight to the construction of the Electrical Connection. There would be a negligible or slight effect in the setting for these Heritage Assets, although this is not considered to be a significant impact.

## Operation

- 4.9.22 During the operational phase, the main potential impacts are likely to be the disruption of the setting and appreciation of the Heritage Assets as a result of the above ground elements of the Electrical Connection. None of these impacts are, however, considered likely to be significant.

Decommissioning

- 4.9.23 During the decommissioning phase, it is not anticipated that there will be any additional impacts other than those mentioned for construction.

Cumulative Impacts

- 4.9.24 Several developments in the vicinity of the Project Site have been assessed for cumulative impacts. The existing wind turbines are visible across the landscape surrounding the Project Site, but are at a greater height than the Power Generation Plant would be. The new overhead line diversion towers may cause a slight cumulative impact for the settings of some of the designated Heritage Assets, however this impact is not considered to be significant. The ground disturbance during the construction of these towers will impact substantially on any below ground archaeological remains. The existing Eye Power Station and National Grid Gas Compressor Station are not visible from the designated Heritage Assets and therefore do not add to the cumulative impacts.

Residual Impacts

- 4.9.25 Based on the results of the environmental assessment, taking into account potential mitigation measures, construction, operation and decommissioning of the Project will not result in any significant effects on cultural heritage and archaeology.

## 4.10 Socio-economics

Introduction

- 4.10.2 The construction, operation and decommissioning phases of the Project have the potential to impact on the labour market, community facilities and tourism sector in the area. A limited amount of agricultural land will also be affected by the Project.
- 4.10.3 The socio-economic assessment is based on drive time catchment areas from the Project Site. The 'local area' is defined within a 30 minute drive time, 'wider area' within a 45 minute drive time, and 'wider region' within a 60 minute drive time. The tourism and agricultural assessments focus on a 15 km radius from the Project Site and the

community infrastructure assessment considers a 5km radius from the Project Site.

- 4.10.4 The full assessment for this topic is provided in Section 14 of the ES. A brief summary is provided below.

Baseline

- 4.10.5 The baseline socio-economic status of the local area surrounding the Project is characterised by a pattern of population increase which is expected to continue until 2021. The area has a declining work age population with over a quarter of the population expected to be at retirement age by 2021. The local area's level of economic activity is comparable to the national average and unemployment levels are relatively low. Retail and wholesaling activity is the single largest employment category in the local area. Agriculture, manufacturing and construction employment in the local area is above the national average.

- 4.10.6 Visitor attractions within 15 km of the Project Site include Eye Castle, Banham Zoo, Mid Suffolk Light Railway Museum, Bressingham Steam and Gardens, Diss Museum, The 100th Bomb Group Memorial Museum, Burston Strike School and Mechanical Music Museum. Services within 5 km of the Project include but are not limited to: twenty five schools, one hospital, two doctors surgeries, five community centres/town halls, five parks/community spaces, one sports ground, two libraries, fourteen local bus routes and one train station.

- 4.10.7 Within the study area there is no excellent quality agricultural land and limited very good agricultural land. Overall, the vast majority of agricultural land in the study area is classed as good or moderate (Grade 3) and, based on the available information, the area affected by the Project is uniformly Grade 3 (including good and moderate quality).

Assessment of Potential Impacts

*Power Generation Plant*

Construction

- 4.10.8 The Project would have minor positive impacts on the socio-economic status of the area through both employment creation and capital expenditure and worker spending in the local economy. It is anticipated that up to 127 construction workers would be required at the Project Site during peak periods. These workers would not only benefit the

economy directly, but would also have knock on effects on other businesses (e.g. guest houses and bakeries).

- 4.10.9 Impacts on tourism and community infrastructure are predicted as a result of visual, noise, traffic and accessibility and air quality impacts. Visual impacts would likely decrease with distance from the Project Site and thus are predicted to be minor. Noise / air quality impacts would be minor. The effects of noise emissions from construction equipment and air emissions such as dust would be restricted to the immediate area. There are no significant clusters of tourism attractions or community infrastructure in close proximity to the Power Generation Plant Site.
- 4.10.10 Traffic / accessibility impacts resulting from an increase in construction traffic would be temporary during the construction phase and would be effectively managed by a Traffic Management Plan thus impacts are predicted to be minor.
- 4.10.11 The amount of agricultural land lost as a result of the Power Generation Plant Site is minimal and therefore not significant.

#### Operation

- 4.10.12 The Project would have minor positive impacts on the socio-economic status of the area during operation. The operational phase would provide an estimated 15 full time equivalent direct jobs.
- 4.10.13 Impacts on tourism and community infrastructure are predicted as a result of visual, noise, traffic and accessibility and air quality impacts. Visual impacts would likely decrease with distance from the Power Generation Plant Site and thus are predicted to be minor. Noise / Air Quality impacts would be minor. Noise emissions and air emissions from operation would only impact the immediate area and there are no significant clusters of tourism attractions or community infrastructure in close proximity to the Power Generation Plant Site.
- 4.10.14 Traffic / accessibility impacts as a result of operational traffic are predicted to be minor as operational traffic would be lower than construction and it would be effectively managed by a Traffic Management Plan.

#### Decommissioning

- 4.10.15 During decommissioning, similar impacts to those predicted during construction are likely to be experienced, with minor positive impacts on the socio-economic status of the area.



*Gas Connection*

Construction

- 4.10.16 During construction there are likely to be minor positive socioeconomic impacts due to employment creation and capital expenditure and worker spending in the local economy.
- 4.10.17 Minor negative impacts would be felt on tourism and community infrastructure in the local area as a result of visual, noise, traffic and accessibility and air quality impacts.
- 4.10.18 The amount of agricultural land lost as a result of the Gas Connection is minimal and therefore not significant.

Operation

- 4.10.19 The operation of the Gas Connection would not generate any noticeable noise or air emissions and would generate very infrequent vehicle trips. Visual impacts would likely decrease with distance from the AGI and thus are predicted to be minor. Therefore, operation of the Gas Connection would not have any significant impacts on the socio-economics of the local area, tourism or community infrastructure.

Decommissioning

- 4.10.20 During decommissioning, similar impacts to those predicted during construction are likely to be experienced, with minor positive impacts on the socio-economic status of the area.

*Electrical Connection*

Construction

- 4.10.21 During construction there are likely to be minor positive socio-economic impacts due to employment creation and capital expenditure and worker spending in the local economy.
- 4.10.22 Minor negative impacts would be felt on tourism and community infrastructure in the local area as a result of visual, noise and air quality impacts.
- 4.10.23 The Electrical Connection Route Corridor crosses the A140 and the Old Road to Norwich to the west of the Project Site. As the main trunk road between Ipswich and Norwich, visitors may experience some delays during the construction period, although the implementation of an

Traffic Management Plan should ensure that no tourism or recreational related businesses / receptors are significantly impacted.

- 4.10.24 The amount of agricultural land lost as a result of the Electrical Connection is minimal and therefore not significant.

#### Operation

- 4.10.25 The operation of the Electrical Connection would not generate any air emissions and vehicle trips would be very infrequent. Visual impacts would likely decrease with distance from the Electrical Connection Compound and thus are predicted to be minor. Any noise produced from the Electrical Connection Compound would be extremely localised. Operation of the Electrical Connection would, therefore, not have any significant impacts on the socio-economics of the local area, tourism or community infrastructure.

#### Decommissioning

- 4.10.26 During decommissioning, similar impacts to those predicted during construction are likely to be experienced, with minor positive impacts on the socio-economic status of the area.

#### *Cumulative Impacts*

- 4.10.27 The construction job requirements associated with other projects in the area which are likely to be constructed at the same time as the Project have been assessed. It has been concluded that there is sufficient labour within a 60 minute drive time of the Project to build each of the projects, excluding the East Anglia ONE offshore wind farm which will have a wider regional and possibly national catchment area. However, the assessment shows there is sufficient capacity in the East of England region to accommodate the development of the cumulative projects including East Anglia.

#### Residual Impacts

- 4.10.28 The Project's construction and operational phases will provide an overall 'slight' significant positive employment impact. It would also present an opportunity to reskill a small section of the currently available workforce, helping to lower the area's unemployment rate and improve productivity and competitiveness. No tourism or recreation receptors or community facilities would be significantly impacted during either the construction or operational phase. The amount of agricultural land lost as a result of the Project is minimal and therefore not significant.

## 4.11 Waste Management and Health

### Introduction

- 4.11.1 The construction, operation and decommissioning of the Project have the potential to generate a variety of waste material that would need to be handled and disposed of correctly in order to avoid impacts on people or the environment. The Project could also create impacts relating directly to human health (e.g. through changes to air quality or water quality).
- 4.11.2 The main potential impacts regarding waste management will be from site preparation during construction. It is anticipated that the main potential impacts to human health arising from the Project will result from changes to local air quality, with potential impacts also arising from pollution incidents, site surface water run-off, electro-magnetic fields and noise.
- 4.11.3 A Conceptual Site Model approach has been used to assess the risks posed by contaminants to public health. This examines the cause of the impact (e.g. stack emissions may result in a change in air quality), the potential human receptors that could be affected and the pathways to these receptors (e.g. exposure via dermal contact, oral contact or inhalation).
- 4.11.4 The full assessment for this topic is provided in Section 15 of the ES. An Electro-Magnetic Field (EMF) Study is included in Appendix 15.A of the ES (Document Reference No: 6.2). A brief summary is provided below.

### Baseline (Receptors)

- 4.11.5 For this assessment potential receptor groups refer only to human receptors that could potentially come into contact with contaminants resulting from the Project. These receptors include:
- Residents of surrounding towns / villages;
  - Adjacent commercial users;
  - Recipients of agricultural produce;
  - Recreational users (e.g. users of public rights of way); and
  - Users of transport infrastructure.
- 4.11.6 Surrounding residential settlements to the Project Site include:
- Eye (1.7 km south east of the Power Generation Plant);

- Langton Green (1.3 km east of the Power Generation Plant);
- Yaxley (1.5 km South West of the Power Generation Plant); and
- Brome (4.75 km north of the Power Generation Plant).

4.11.7 Adjacent commercial users include other businesses within the former Eye Airfield.

Potential Impacts

*Power Generation Plant*

Construction

4.11.8 During construction, the pathways for the Project to impact upon human receptors will potentially be through inhalation of emissions from waste and dermal contact / ingestion of leachate from waste that could contaminate soils.

4.11.9 In order to limit any impacts, an agreed Construction Environmental Management Plan will be implemented to ensure that all construction waste is dealt with in a manner that complies with relevant legislation. The Construction Environmental Management Plan provides for the submission of a Site Waste Management Plan for approval by the local authority prior to commencement of construction. Mitigation measures will include, amongst others, the stockpiling of excavated spoil and testing for Waste Acceptance Criteria, to determine whether it can be re-used on- or off-site, and the testing and removal, as appropriate, of any water from de-watering activities which will be handled by a suitably licensed waste contractor.

4.11.10 The Construction Environmental Management Plan would also include measures to mitigate public health impacts including controlling dust and noise, preventing the escape of contaminants and a suggested protocol to follow in the event of construction workers discovering contaminated materials or unexploded ordinance.

4.11.11 Following the implementation of mitigation, no significant public health impacts are predicted with regards to air quality, noise, water quality or land contamination during construction of the Power Generation Plant.

Operation

4.11.12 During operation of the Power Generation Plant, minimal quantities of waste would be generated, such as general office wastes, separated oil / sludge from oil / waste separators and used oil, chemicals or chemical containers.

4.11.13 During operation, only small quantities of potentially hazardous waste will be stored on the Power Generation Plant Site at any one time, and any such substances will be held in secured containers to prevent contaminant migration. Closed storage facilities or suitable dampening techniques will be utilised within the Power Generation Plant where emissions of dust etc. from waste are possible. All mitigation measures will be in full accordance with industry good practices. All waste will be dealt with in a manner that complies with relevant legislation.

4.11.14 The main potential impact on human health during operation of the Power Generation Plant is from the generation of stack emissions which could affect air quality. As explained in the Air Quality Section of the ES, no significant adverse air quality impacts are predicted and it is extremely unlikely that the Power Generation Plant will have any adverse public health impacts with respect to air quality.

#### Decommissioning

4.11.15 A full Environmental Departure Audit will be carried out prior to decommissioning. This will examine, in detail, all potential environmental risks existing at the Power Generation Plant Site and make comprehensive recommendations for any remedial action required to remove such risks.

4.11.16 During decommissioning, impacts on public health will be similar to those for construction. An agreed demolition and restoration plan would be implemented to mitigate any effects on public health from the decommissioning of the Power Generation Plant.

4.11.17 Following completion of the demolition, a Final Environmental Departure Audit will be carried out to ensure that all remedial work has been completed successfully.

#### *Gas Connection*

#### Construction

4.11.18 During construction of the Gas Connection, activities would involve excavation of a trench, temporary stockpiling of soils and subsoils and then subsequent backfilling.

4.11.19 As with the Power Generation Plant, an agreed Construction Environmental Management Plan will be implemented to ensure that all construction waste is dealt with in a manner that complies with relevant legislation. Measures to mitigate public health impacts including controlling dust and noise, preventing the escape of contaminants and a suggested protocol to follow in the event of construction workers

discovering contaminated materials or unexploded ordinance will also be included within the Construction Environmental Management Plan.

- 4.11.20 Following the implementation of mitigation, no significant public health impacts are predicted with regards to air quality, noise, water quality or land contamination during construction of the Gas Connection.

Operation

- 4.11.21 No waste will be generated through the operation of the Gas Connection and no pollutants will be emitted. Small amounts of noise would be generated by the AGI, although this will rarely be perceptible except when in very close proximity to the AGI. As such, operation of the Gas Connection will result in no adverse public health impacts.

Decommissioning

- 4.11.22 During decommissioning, impacts on public health will be similar to those for construction. An agreed demolition and restoration plan would be implemented to mitigate any effects on public health.

*Electrical Connection*

Construction

- 4.11.23 During construction of the Electrical Connection, activities would involve excavation of a trench, temporary stockpiling of soils and subsoils and then subsequent backfilling.

- 4.11.24 As with the Power Generation Plant, an agreed Construction Environmental Management Plan will be implemented to ensure that all construction waste is dealt with in a manner that complies with relevant legislation. Measures to mitigate public health impacts including controlling dust and noise, preventing the escape of contaminants and a suggested protocol to follow in the event of construction workers discovering contaminated materials or unexploded ordinance will also be included within the Construction Environmental Management Plan.

- 4.11.25 Following the implementation of mitigation, no significant public health impacts are predicted with regards to air quality, noise, water quality or land contamination during construction of the Electrical Connection.

Operation

- 4.11.26 No waste will be generated through the operation of the Electrical Connection and no pollutants will be emitted. It is possible that a low 'hum' may be audible during operation of the Electrical Connection

Compound, however, this noise is usually imperceptible except when within close proximity or during specific meteorological conditions. The EMF study for the Project has also concluded that the EMF strength for the Project would be the same as that which is already present associated with the existing 400 kilovolts Norwich Main to Bramford overhead line and remains within occupational exposure guideline levels. As such, operation of the Electrical Connection will result in no adverse public health impacts.

#### Decommissioning

During decommissioning, impacts on public health will be similar to those for construction. An agreed demolition and restoration plan would be implemented to mitigate any effects on public health.

#### Residual Impacts

- 4.11.27 Based on the results of the environmental assessment, taking into account potential mitigation measures, construction, operation and decommissioning Project will not result in adverse public health impacts. In addition, the Project is not predicted to have any likely significant adverse effects arising from waste management.

## **4.12 Conclusion**

- 4.12.1 Table 2 overleaf provides a summary of the mitigation measures and residual impacts of the Project for each environmental assessment topic. Further detail is provided in the ES (Document Reference 6.1) under the mitigation section for each topic (Sections 6-15).

**Table 2 - Summary of Mitigation Measures and Residual Impacts for the Project**

Topic	Summary of Mitigation	Residual Impacts
Air Quality	<p>Construction: Site Specific Dust Management Plan to be developed as part of the Construction Environmental Management Plan.</p> <p>Operation: implicitly included in the Project design, namely a stack height 25 – 30 m, along with emissions control to maintain emissions within set limits. Stack emissions will be monitored. If the Substation is gas insulated, a programme of leakage detection and prevention will be put in place to minimise emissions of sulphur hexafluoride (SF<sub>6</sub>).</p> <p>Decommissioning: similar to construction, with procedures put in place to reclaim, with minimal losses, the SF<sub>6</sub> gas, if the Substation is gas insulated.</p>	<p>Negligible impacts during construction and decommissioning of the Project.</p> <p>Negligible impacts for ecosystems, but Negligible to Slight Adverse impacts for human health during operation of the Project due to gas combustion emissions (NO<sub>x</sub> and CO) from the Power Generation Plant.</p>
Noise & Vibration	<p>Construction: Construction Environmental Management Plan, works in accordance with BS 5228, communication with local residents, core working hours, ancillary pneumatic percussive tools fitted with mufflers or silencers, positioning of equipment to reduce noise.</p> <p>Operation: Site layout and orientation of plant items, use of inherently quiet plant items where possible, acoustic enclosures, high performance silencers, acoustic lagging, low noise trims, noise limits to be agreed with Mid Suffolk District Council.</p> <p>Decommissioning: similar to construction.</p>	<p>Noise impacts during construction, operation and decommissioning of the Project are Minor Adverse.</p> <p>Vibration impacts during construction, operation and decommissioning of the Project are Negligible.</p>
Ecology	<p>Construction: Designed-in mitigation and avoidance measures detailed in the Construction Environmental Management Plan. Root protection zones will be demarked within which construction activities will not be undertaken. Lighting scheme will ensure</p>	<p>No significant adverse impacts on ecological receptors have been identified during construction,</p>



	<p>minimal light spillage and directional lighting. Vegetation clearance will be undertaken outside the breeding bird season. A Landscaping Mitigation Strategy 9(Document Reference 10.6) will incorporate significant hedgerow and woodland habitat planting. If great crested newts are found to be present during further survey work, a European Protected Species Mitigation Licence application will be produced and submitted to Natural England for consideration.</p> <p>Operation: designed-in mitigation of stack height provides sufficient dispersion rate. Lighting scheme for the Project will ensure minimal light spillage and directional lighting therefore ensuring that compensatory habitat is not lit and suitable for use as nesting, commuting and refuge for wildlife. Drainage design to avoid pollution of water body to avoid impact to Great Crested Newts.</p> <p>Decommissioning: implementation of an Environmental Management Plan which will avoid/minimise generation of excessive litter, dust, noise and vibration and will prevent accidental pollution of adjacent habitats</p>	<p>operation and decommissioning of the Project.</p> <p>During construction of the Project there will be a permanent, positive impact due to the landscaping strategy which will provide a net gain in habitat quantity and quality.</p>
Water Quality & Resources	<p>Construction: Construction Environmental Management Plan, works in accordance with Environment Agency Pollution Prevention Guidelines, industry best practices and BS 6031 and BS 8004, use of ready mixed concrete.</p> <p>Operation: Designed in accordance with Environment Agency Pollution Prevention Guidelines and industry best practice to minimise risk to water quality, resources and flooding.</p> <p>Decommissioning: similar to construction.</p>	<p>Negligible impacts during construction, operation and decommissioning of the Project.</p>
Geology, Ground	<p>Construction: designed to minimise land take, with the Gas and Electrical Connection Route Corridors designed to follow field</p>	<p>A Large local adverse impact on agriculture during</p>

<p>Conditions &amp; Agriculture</p>	<p>boundaries where possible, to reduce the loss of agricultural land. Design and completion of a geoenvironmental site investigation prior to construction, with supervision by an Explosive Ordnance Clearance operative. Construction Environmental Management Plan, working in accordance with best practices, maintaining safe working practices and the use of correct and appropriate Personal Protective Equipment.</p> <p>Operation: in accordance with appropriate guidance and in line with the Site Environmental Permit.</p> <p>Decommissioning: similar to construction, with a decommissioning plan prepared in compliance with best practice.</p>	<p>construction and operation of the Project due to the loss of moderate quality agricultural land. All other impacts are Slight adverse.</p>
<p>Landscape &amp; Visual Impacts</p>	<p>Construction: work in accordance with the Construction Environmental Management Plan, tree retention and protection, lighting in accordance with the Outline Lighting Layout (Document Reference 2.10), Landscape Mitigation Strategy (Document Reference 10.6) and planting as soon as possible after sections of work are complete.</p> <p>Operation: utilising technology (Simple Cycle Gas Turbine plant) that would allow a significant reduction in stack height compared to other technology types, architectural design of the buildings and structures to reduce glare and assimilate the Project into the surrounding landscape, directional lighting to avoid glare and spillage. Mitigation screen planting around the Power Generation Plant Ste, AGI Site and Electrical Connection Compound Site. Routine maintenance and monitoring of all planting areas with annual replacement to achieve design and mitigation objectives. Undertake additional planting where further screening is required. PPL is offering to make a contribution to Mid Suffolk District Council to be spent by the Council on enhancing or improving landscape and visual amenity within the areas within the parish councils of</p>	<p>Moderate adverse, short term impacts during construction of the Project.</p> <p>Moderate adverse, short to medium term, significant impacts during operation of the Project arising from Gas and Electrical Connections, but reducing after mitigation planting takes effect.</p> <p>No significant impacts during decommissioning of the Project.</p>

	<p>Eye, Yaxley and Thrandeston.</p> <p>Decommissioning: Landscape restoration and management plans would be submitted for agreement with Mid Suffolk District Council prior to commencement of any demolition works.</p>	
Traffic, Transport & Access	<p>Construction: Construction Traffic Management Plan and Construction Worker Travel Plan to minimise traffic disruption. Management of Public Rights of Way will be discussed in detail as part of the Project.</p> <p>Operation: Operational Worker Travel Plan. PPL is offering to make a contribution to Mid Suffolk District Council to be spent by the Council on improving pedestrian, cycling and equestrian connectivity between the Project, the village of Eye and the Eye Airfield.</p>	<p>Minor impacts during construction and decommissioning of the Project.</p> <p>Negligible impacts during operation of the Project.</p>
Cultural Heritage and Archaeology	<p>Construction: pre-construction determine significance of two heritage assets to determine if they can be retained <i>in situ</i>. Carry out trial trenching and further excavation work in accordance with the Written Scheme of Investigation, monitor ground disturbance during construction and topsoil stripping activities. The requirements would be summarised in the Construction Environmental Management Plan.</p> <p>Operation: no mitigation required.</p> <p>Decommissioning: no mitigation required.</p>	<p>Slight to Moderate / Slight impacts on the setting of designated Heritage Assets and Neutral / Slight to Slight impacts on the setting of non-designated Heritage Assets during the construction and operation of the Project.</p> <p>Neutral impact on buried heritage assets during construction of the Project.</p>
Socio-Economics	<p>No mitigation required, but PPL have committed to provision of an education and employment scheme, discussions are still ongoing with MSDC and SCC regarding the method of delivery.</p>	<p>Slight positive socio-economic benefits from the Project due to the potential to use local workforce and</p>

		<p>resources.</p> <p>Slight adverse, but not significant impacts on tourism, recreation and community infrastructure during construction, operation and decommissioning of the Project.</p> <p>No significant impacts on agricultural land from the Project.</p>
<p>Waste Management &amp; Health</p>	<p>Construction: Construction Environmental Management Plan to include Site Waste Management Plan, working in accordance with best practices and the use of correct and appropriate Personal Protective Equipment.</p> <p>Operation: As per mitigation listed under Air Quality, Noise and Vibration, Water Quality and Resources and Geology, Ground Conditions &amp; Agriculture.</p> <p>Decommissioning: Environmental Departure Audit, Demolition and Restoration Plan and Final Environmental Departure Audit.</p>	<p>No adverse public health impacts during construction, operation and decommissioning of the Project.</p>