Medworth Energy from Waste
Combined Heat and Power Facility

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Environmental Statement Chapter 2 Alternatives. Appendix 2A Grid Connection Options Report

Regulation reference: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

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Executive Summary

This report explains the method adopted to identify the appropriate point of connection to the grid for the Proposed Development. It also explains the approach taken to identify the Grid Connection corridor, the options considered for the alignment, and finally the chosen, Preferred Alignment and choice of either an overhead line (OHL), combination of OHL and underground cable, or wholly underground cable connection. This document also explains how the point of connection was chosen and the alternative electrical equipment choices which were considered.

The method employed initially assumed an overhead connection unless environmental or other considerations were such that undergrounding would represent an appropriate mitigation.

Consideration of the Grid Connection began with consultation between the Applicant, UKPN (the DNO) and National Grid to understand the points on the existing electricity network at which a point of connection (POC) could be made. Responses received suggested a choice between a connection between a National Grid 400kV overhead line approximately 6km to the east of the EfW CHP Facility or the Walpole DNO Substation. Employing a method consistent with the Holford Rules, and guided by national and local planning policy, Grid Connection corridors were identified to connect to each location, and both formed the scoping boundary published with the EIA Scoping Report. The corridors were selected based on a review of environmental constraints and were consulted on at non-statutory consultation.

Following a review of consultation responses, the comparative environmental performance of each corridor was considered and, taking in account the relative costs of connection, a preference for the Walpole DNO Substation over the National Grid 400kV overhead line was made. Subsequent environmental constraint mapping informed the technical design to provide a Preferred Route Alignment which would be a combination of underground and OHL to Walpole, and it was this design which was taken forward at statutory consultation.

As initial discussions with UKPN in August 2019 indicated that there was insufficient capacity to connect the Proposed Development at Walsoken DNO Substation, this was not originally pursued as an option. However, further discussions with UKPN suggested that a constrained connection at Walsoken DNO Substation would be possible and the level of curtailment that would need to be applied to achieve this connection would be acceptable. Consequently, a second option for the Preferred Route Alignment was designed, informed by environmental constraint mapping. This option to connect to the Walsoken DNO Substation was also consulted on at statutory consultation.

Responses received from statutory consultation relating to the Grid Connection were reviewed. Information regarding potential residential development adjacent to the A47 was obtained and discussions were held with National Highways to understand the potential for locating the connection underground, within the verge of the A47. In parallel it was confirmed with UKPN that the point of connection at Walsoken would be sufficient to accommodate the export of electricity from the EfW CHP Facility. An environmental, technical, and cost review of connecting to the Walpole and Walsoken DNO Substations was then undertaken which concluded that the Walsoken DNO Substation would be the preferred POC.

Where a preference was indicated, statutory consultation responses were clear that an underground connection was preferable to overhead OHL, or a combination of OHL and underground cabling. A consideration of environmental impacts, particularly during operation concluded that such impacts would be significantly reduced if the entire connection was underground. National Highways are supportive of an underground cable in the verge of the A47. Whilst the cost of a wholly underground connection is £1m more than the alternatives considered, the environmental and land use benefits are considered sufficient to outweigh this difference, and a wholly underground connection along New Bridge Lane, the A47 verge and Broadend Road has been selected and it is this option which has been included in the DCO application and assessed and reported within the ES.

Contents

1. Introduction

1.1 Background

1.1.1 Medworth CHP Limited (the Applicant) is applying to the Secretary of State for a Development Consent Order (DCO) to construct operate and maintain an Energy from Waste (EfW) Combined Heat and Power (CHP) Facility on the industrial estate, Algores Way, Wisbech, Cambridgeshire. Together with associated Grid Connection, CHP Connection, Water Connections, and Temporary Construction Compound (TCC), these works are the Proposed Development.

1.1.2 The Proposed Development would recover useful energy in the form of electricity and steam from over half a million tonnes of non-recyclable (residual), non-hazardous municipal, commercial and industrial waste each year. The Proposed Development has a generating capacity of over 50 megawatts and the electricity would be exported to the grid. The Proposed Development would also have the capability to export steam and electricity to users on the surrounding industrial estate.

1.1.3 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under Part 3 Section 14 of the Planning Act 2008 (2008 Act) by virtue of the fact that the generating station is located in England and has a generating capacity of over 50 megawatts (section 15(2) of the 2008 Act). It, therefore, requires an application for a DCO to be submitted to the Planning Inspectorate (PINS) under the 2008 Act. PINS will examine the application for the Proposed Development and make a recommendation to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS) to grant or refuse consent. On receipt of the report and recommendation from PINS, the SoS will then make the final decision on whether to grant the Medworth EfW CHP Facility DCO.

1.2 The Applicant and the project team

1.2.1 The Applicant is a wholly owned subsidiary of MVV Environment Limited (MVV). MVV is part of the MVV Energie AG group of companies. MVV Energie AG is one of Germany's leading energy companies, employing approx. 6,500 people with assets of around €5 billion and annual sales of around €4.1 billion. The Proposed Development represents an investment of approximately £450m.

1.2.2 The company has over 50-years' experience in constructing, operating, and maintaining EfW CHP facilities in Germany and the UK. MVV Energie's portfolio includes a 700,000 tonnes per annum residual EfW CHP facility in Mannheim, Germany.

1.2.3 MVV Energie has a growth strategy to be carbon neutral by 2040 and thereafter carbon negative, i.e., climate positive. Specifically, MVV Energie intends to:

- reduce its direct carbon dioxide (CO_2) emissions by over 80% by 2030 compared to 2018;
- reduce its indirect CO_2 emissions by 82% compared to 2018;

- be climate neutral by 2040; and
- be climate positive from 2040.

1.2.4 MVV's UK business retains the overall group ethos of 'belonging' to the communities it serves whilst benefitting from over 50 years' experience gained by its German sister companies.

1.2.5 MVV's largest project in the UK is the Devonport EfW CHP Facility in Plymouth. Since 2015, this modern and efficient facility has been using around 265,000 tonnes of municipal, commercial and industrial residual waste per year to generate electricity and heat, notably for Her Majesty's Naval Base Devonport in Plymouth, and exporting electricity to the grid.

1.2.6 In Dundee, MVV has taken over the existing Baldovie EfW Facility and has developed a new, modern facility alongside the existing facility. Operating from 2021, it uses up to 220,000 tonnes of municipal, commercial and industrial waste each year as fuel for the generation of usable energy.

1.2.7 Biomass is another key focus of MVV's activities in the UK market. The biomass power plant at Ridham Dock, Kent, uses up to 195,000 tonnes of waste and non-recyclable wood per year to generate green electricity and is capable of exporting heat.

1.2.8 To prepare the ES for the Proposed Development, the Applicant has engaged Wood Group UK Limited (Wood). Wood is registered with the Institute of Environmental Management and Assessment (IEMA)'s Environmental Impact Assessment (EIA) Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1.3 The Proposed Development

1.3.1 The Proposed Development comprises the following key elements:

- The EfW CHP Facility;
- CHP Connection;
- Temporary Construction Compound (TCC);
- Access Improvements;
- Water Connections; and
- Grid Connection.

1.3.2 A summary description of each Proposed Development element is provided below. A more detailed description is provided in **ES Chapter 3: Description of the Proposed Development (Volume 6.2)** of the ES. A list of terms and abbreviations can be found in **Chapter 1 Introduction, Appendix 1F Terms and Abbreviations (Volume 6.4)**.

- EfW CHP Facility Site: A site of approximately 5.3ha located south-west of Wisbech, located within the administrative areas of Fenland District Council

(FDC) and Cambridgeshire County Council (CCC). The main buildings of the EfW CHP Facility would be located in the area to the north of the Hundred of Wisbech Internal Drainage Board (HWIDB) drain bisecting the site and would house many development elements including the tipping hall, waste bunkers, boiler house, turbine hall, air cooled condenser, air pollution control building, chimneys and administration building. The gatehouse, weighbridges, 132kV switching compound and laydown maintenance area would be located in the southern section of the EfW CHP Facility Site.

- CHP Connection: The EfW CHP Facility would be designed to allow the export of steam and electricity from the facility to surrounding business users via dedicated pipelines and private wire cables located along the disused March to Wisbech Railway. The pipeline and cables would be located on a raised, steel structure.
- TCC: Located adjacent to the EfW CHP Facility Site, the compound would be used to support the construction of the Proposed Development. The compound would be in place for the duration of construction.
- Access Improvements: includes access improvements on New Bridge Lane (road widening and site access) and Algores Way (relocation of site access 20m to the south).
- Water Connections: A new water main connecting the EfW CHP Facility into the local network will run underground from the EfW CHP Facility Site along New Bridge Lane before crossing underneath the A47 (open cut trenching or horizontal directional drilling (HDD)) to join an existing Anglian Water main. An additional foul sewer connection is required to an existing pumping station operated by Anglian Water located to the northeast of the Algores Way site entrance and into the EfW CHP Facility Site.
- Grid Connection: This comprises a 132kV electrical connection using underground cables. The Grid Connection route begins at the 132kV switching compound in the EfW CHP Facility Site and runs underneath New Bridge Lane, before heading north within the verge of the A47 to the Walsoken Substation on Broadend Road. From this point the cable would be connected underground to the Walsoken DNO Substation.

1.4 Purpose of the report

1.4.1 This Grid Connection Options Report has been prepared to explain the process of appraising options for the Grid Connection, selecting the preferred Grid Connection Corridor, identifying the preferred alignments assessed within the PEIR, and the work undertaken to finalise the connection resulting in the option for which a Development Consent Order (DCO) is sought. It represents a continuation of the Grid Connection Corridor Report which was issued for non-statutory consultation in September 2020 and that which was issued for statutory consultation in June 2021.

1.4.2 Terms and abbreviations used within this chapter are defined in **Appendix 1F: Terms and Abbreviations (Volume 6.4)**.

1.5 Legislation

1.5.1 The Proposed Development requires an Environmental Statement (ES) to report the outcomes of the Environmental Impact Assessment (EIA). The EIA has been carried out in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)[1] ('the EIA Regulations').

1.5.2 The EIA Regulations mandate that the ES must include:

"a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment." (Regulation 14(2)(d)).

1.5.3 The information presented in this report forms an appendix to ES **Chapter 2 Alternatives (Volume 6.2).**

1.6 Policy

National Policy Statements

1.6.1 As a Nationally Significant Infrastructure Project (NSIP), the primary policy basis for the Proposed Development is the relevant National Policy Statements (NPS). A summary of the relevant NPS and their application to the Grid Connection corridor selection process is outlined below.

Overarching National Policy Statement for Energy (EN-1)[2];

1.6.2 This document sets out national policy for energy infrastructure. It has effect, in combination with the relevant technology-specific NPS, on the decisions made by the Secretary of State on applications for energy developments.

1.6.3 NPS EN-1 recognises that whilst the applicant may not have any, or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform, and vegetation.

National Policy Statement for Renewable Energy (EN-3)[3];

1.6.4 This policy document sits alongside NPS EN-1 and sets out the national policy for renewable energy infrastructure. The policy recognises that the success of an EfW plant is dependent on the ability to connect to the national grid. It states that a DCO application must include information on how a project will be connected to the grid, and what environmental issues are likely to arise from the connection.

[1] SI 572. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
[2] Department for Energy and Climate Change. Overarching National Policy Statement for Energy (EN-1) 2011
[3] Development for Energy and Climate Change. National Policy Statement for Renewable Energy Infrastructure (EN-3) 2011

National Policy Statement for Electricity Networks Infrastructure (EN-5)[4]

1.6.5 NPS EN-5 provides more advice on the approach to selecting, assessing, and considering electricity networks infrastructure. Relevant to the current scope, it advises that infrastructure should be resilient to climate change, defined as:

- Flooding, particularly for substations that are vital for electricity distribution and the distribution network;
- The effects of wind and storms on overhead lines;
- Higher average temperatures, leading to increased distribution losses; and
- Earth movement or subsidence caused by flooding or drought (for underground cables).

1.6.6 NPS EN-5 sets out additional technology specific considerations on the following generic effects considered in NPS EN-1:

- Biodiversity and geological conservation;
- Landscape and visual;
- Noise and vibration; and
- Electric and magnetic fields.

1.6.7 With regards to biodiversity, it states that particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds. For landscape and visual matters, NPS EN-5 references the Holford Rules which form a key consideration in overhead line routeing, as set out elsewhere in this report. Assessment guidance on the topics of noise and electric and magnetic fields focuses on approaches to assessment and the possibilities of mitigation through the design and specification of the infrastructure itself.

1.6.8 Under the sub-heading Landscape and Visual, paragraph 2.8.2 sets out the Government's view that it does not believe that development of overhead lines is generally incompatible in principle with developers' statutory duty under section 9 of the Electricity Act to have regard to amenity and to mitigate impacts (see paragraph 2.2.6). Whilst recognising that above ground electricity lines can give rise to adverse landscape and visual impacts, the degree can be dependent upon their scale, siting, degree of screening and the nature of the landscape and local environment through which they are routed. In the opinion of Government, such impacts can in the most part be mitigated. Government does accept however that there are, on some occasions, locations that might be considered particularly sensitive to the potential adverse landscape and visual impacts, such that it may be necessary to consider if undergrounding is acceptable in planning terms in the specific local environment and context.

1.6.9 Paragraph 2.8.8 considers the subject of undergrounding and states that where there are serious concerns about potential adverse landscape and visual effects arising from a proposed overhead connection that these need to be balanced by the decision-maker against other relevant factors, including the need for the proposed

[4] Department for Energy and Climate Change. National Policy Statement for Electricity Networks Infrastructure (EN-5) 2011

infrastructure, the availability and cost of alternative sites and routes and methods of installation (such as undergrounding). Particular sensitivities to consider include the presence of residential areas, national parks or Areas of Outstanding Natural Beauty (AONB) and the potential environmental and archaeological effects, as well as the additional cost of undergrounding.

1.6.10 NPS EN-5 also refers to the potential effects of electromagnetic fields (EMFs). However, it notes that the Electricity Safety, Quality and Continuity Regulations 2002[5] (ESQC 2002) set out the minimum height, position, insulation and protection specifications at which conductors can be strung between towers to ensure safe clearance of objects. The effect of these requirements should be that power lines at, or below 132kV will comply with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998[6] basic restrictions, although the decision-maker should be satisfied that this is the case on the basis of the evidence produced as specified in the "Power Lines: Demonstrating compliance with EMFs public exposure guidelines – a voluntary Code of Practice" published in 2011 by Government and the electricity industry.

Draft Overarching National Policy Statement for Energy (EN-1)[7]

1.6.11 In September 2021 the Department for Business, Energy and Industrial Strategy commenced consultation on draft national policy statements for energy. NPS EN-1 provides up to date government policy on energy and energy infrastructure development, on the need for nationally significant energy projects, assessment principles and generic impacts relevant to all energy infrastructure.

1.6.12 Section 4.10 Grid Connection states that the government envisages that applications for new generating stations and related infrastructure should be contained in a single application wherever possible.

Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)[8]

1.6.13 Paragraph 2.10.2 notes that EfW electricity generating stations connect into the transmission network and in the following paragraph it is stated that applicants will have usually assured themselves that a viable connection exists.

Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)[9]

1.6.14 This statement would provide the primary policy for the consideration of application for electricity networks. It presents policy advice on the technology of electricity networks and matters to be considered when assessing such projects.

1.6.15 Section 2.2, paragraph 2.2.1 explains some of the factors influencing site selection recognising that points of connection (POC) can often be determined by the

[5] SI 2665. The Electricity Safety, Quality and Continuity Regulations 2002.
[6] ICNIRP. ICNIRP Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz) 1998
[7] Department for Business, Energy and Industrial Strategy. Draft Overarching National Policy Statement for Energy (EN-1) 2021
[8] Department for Business, Energy and Industrial Strategy. Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) 2021
[9] Department for Business, Energy and Industrial Strategy. Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) 2021

Electrical System Operator informed both by the location of a new generating station and by system capacity.

1.6.16 Paragraph 2.2.3 however reminds applicants that they need not propose a line along the most direct route because engineering, environmental and community constraints may make such a route infeasible or unsuitable. When considering substation locations, paragraph 2.2.4 requires that applicants consider characteristics such as local topography and/or the possibilities for screening.

1.6.17 The draft national policy statement identifies the same factors to be considered for climate resilience as those referred to above in the context of the current NPS EN-5. Reference is also made at paragraph 2.10.2 to the same biodiversity considerations.

1.6.18 Landscape and Visual is considered in Section 2.11 which restates government belief that an overhead line is not incompatible in principle with a developers' statutory duty to have regard to visual and landscape amenity. Similar reference is also made to the development of substations or sealing end compounds, or other above-ground installations which serve as switching, connection, and voltage transformation points on the network.

1.6.19 Paragraph 2.11.8 states that where significant landscape and/or visual impacts are likely to result from overhead lines that the costs and benefits of feasible alternatives including underground are considered. The relevance of the Holford Rules to the routing of new overhead lines and Horlock Rules for the siting of substations is also re-stated.

1.6.20 Consideration of undergrounding is provided in paragraphs 2.11.13 to 2.11.20. The presumption for overhead lines is reversed within nationally designated landscapes and in other areas where widespread and significant landscape and/or visual effects may arise. In such circumstances consideration must be given to the cost, feasibility and harm of undergrounding versus an overhead alternative.

1.6.21 Draft NPS EN-5 provides policy with regard to the consideration of noise and vibration noting that high voltage lines have the potential to generate noise under certain conditions and that in the case of overhead lines advice on the approach to be taken in the assessment of noise is provided. For the assessment of noise at substations relevant British Standards are considered satisfactory. Mitigation in the form of routing away from potentially sensitive Receptors is cited as a measure to be considered.

1.6.22 Advice similar to that provided in the existing NPS EN-5 is provided for the consideration of effects arising from Electric and Magnetic Fields (EMF).

National Planning Policy Framework[10]

1.6.23 Whilst NPSs provide the main policy basis for decisions on NSIPs other policy may be considered both important and relevant. The main national planning policy is the Revised National Planning Policy Framework (NPPF). It sets out the Government's planning policies for England.

[10] Ministry of Housing, Communities & Local Government Revised National Planning Policy Framework 2021

1.6.24 The NPPF highlights that development should be designed to ensure that it will not be vulnerable to the impacts of climate change, should seek to reduce greenhouse gas emissions, and should not increase the risk of flooding.

1.6.25 The NPPF outlines factors of the natural and historic environment that should be protected from the impacts of new development.

Local Planning Policy

1.6.26 The EfW CHP Facility Site is located within Fenland District in the County of Cambridgeshire. The Grid Connection would extend from this area into the Borough Council of King's Lynn and West Norfolk (KLWN) and Norfolk County Council (NCC). Local development plans may be an important and relevant consideration for NSIPs, although like the NPPF, they are not the primary policy.

1.6.27 A summary of the policies relevant to the Grid Connection corridor selection process are set out in Table 2A.1 **Local policies relevant to the Grid Connection** below.

Table 2A.1 Local policies relevant to the Grid Connection

Policy Document	Topic	Policy
Fenland Local Plan[11]	**Landscape and Visual**	**Policy LP16:** Proposals for all new development will only be permitted if it can be demonstrated that the proposal meets, amongst other criteria: • makes a positive contribution to the local distinctiveness and character of the area, enhances its local setting, responds to and improves the character of the local built environment, provides resilience to climate change, reinforces local identity and or scale terms, on the street scene, settlement pattern or the landscape character of the surrounding area; and • provides well designed hard and soft landscaping incorporating sustainable drainage systems as appropriate.
	Biodiversity	**Policy LP16:** Proposals for all new development, will only be permitted if it can be demonstrated that the proposal meets all of the following relevant criteria: • protects and enhances biodiversity on and surrounding the proposal site, taking into account locally designated sites and the special protection given to internationally and nationally designated sites, in accordance with Policy LP19; • retains and incorporates natural and historic features of the site such as trees, hedgerows, field patterns, drains and water bodies; • provides well designed hard and soft landscaping incorporating sustainable drainage systems as appropriate; • complements and enhances the quality of riverside settings, including ecological value and re-naturalisation where possible; and • A Supplementary Planning Document (SPD) to be adopted in 2014 will be used to further assess planning applications in

[11] Fenland District Council. Fenland Local Plan 2014

Policy Document	Topic	Policy
		relation to the criteria in this policy. The SPD was adopted subsequently on 24 July 2014 and provides additional guidance on matters of potential relevance to the Proposed Development including buildings of local importance, the protection of natural features, local distinctiveness and character. **Policy LP19:** The Council, working in partnership with all relevant stakeholders, will conserve, enhance and promote the biodiversity interest of the natural environment throughout Fenland. The Council will: • Protect and enhance sites which have been designated for their international, national or local importance to an extent that is commensurate with their status, in accordance with national policy in the National Planning Policy Framework; • Refuse permission for development that would cause demonstrable harm to a protected habitat or species, unless the need for and public benefits of the development clearly outweigh the harm and mitigation and/or compensation measures can be secured to offset the harm and achieve, where possible, a net gain for biodiversity; • Promote the preservation, restoration and re-creation of priority habitats, and the preservation and increase of priority species identified for Fenland in the Cambridgeshire and Peterborough Biodiversity Action Plans; and • Ensure opportunities are taken to incorporate beneficial features for biodiversity in new developments, including, where possible, the creation of new habitats that will contribute to a viable ecological network extending beyond the District into the rest of Cambridgeshire and Peterborough, and other adjoining areas.
	Water Environment	**Policy LP14:** Part (A) Resource Use, Renewable Energy and Allowable Solutions: The Policy recommends that all developments incorporate on site renewable and/or decentralised renewable or low carbon energy sources, water saving measures and measures to help the development withstand the longer-term impacts of climate change. Part (B) Flood Risk and Drainage: The Policy requires that: • All development proposals should adopt a sequential approach to flood risk from all forms of flooding; • Sustainable Drainage Systems (SuDs) are used to ensure that runoff from the site (post development) is to greenfield runoff rates for all previously undeveloped sites and for developed sites (where feasible); • The discharge of surface water from developments should be designed to contribute to an improvement in water quality in the receiving water course or aquifer in accordance with the objectives of the Water Framework Directive; and • All proposals should have regard to the guidance and byelaws of the relevant Internal Drainage Board, including, where appropriate the Middle Level Strategic Study and should help achieve the flood management goals from the River Nene and Great Ouse Catchment Flood Management Plans.

Policy Document	Topic	Policy
		Policy LP16: The Policy sets out the following requirements with respect to hydrology: • Makes a positive contribution to the local distinctiveness and character of the area, enhances its local setting, responds to and improves the character of the local built environment, provides resilience to climate change, reinforces local identity and does not adversely impact, either in design or scale terms, on the street scene, settlement pattern or the landscape character of the surrounding area; • Provides well designed hard and soft landscaping incorporating sustainable drainage systems as appropriate; • Identifies, manages and mitigates against any existing or proposed risks from sources of noise, emissions, pollution, contamination, odour and dust, vibration, landfill gas and protects from water body deterioration; • The site is suitable for its proposed use with layout and drainage taking account of ground conditions, contamination and gas risks arising from previous uses and any proposals for land remediation, with no significant impacts on future users, groundwater or surface waters; and • Complements and enhances the quality of riverside settings, including ecological value, re-naturalisation where possible, and navigation.
	Socio-economics	**Policy LP2:** Development proposals should contribute to the Council's goal of Fenland's residents achieving the highest attainable standard of health, irrespective of their race, religion, political belief, economic or social condition, sex or age. Development proposals should contribute to creating a healthy, safe and equitable living environment by: Creating an environment (built and social) in which communities can flourish (see all policies in this plan): • Creating opportunities for employment in accessible locations; • Promoting and facilitating healthy lifestyles; and • Avoiding adverse impacts. **Policy LP8:** Wisbech, alongside March, is the main focus for housing, employment and retail growth. All development should contribute to the promotion of Wisbech into a strong, safe and community focused market town, preserving and enhancing its unique character and making appropriate use of its heritage assets to benefit its regeneration, tourism potential and sense of place. **Policy LP14**: Renewable energy proposals will be supported and considered in the context of sustainable development and climate change. Proposals for renewable energy technology, associated infrastructure and integration of renewable technology on existing or proposed structures will be assessed both individually and cumulatively on their merits taking account of the following factors: Surrounding landscape, townscape and heritage assets: • Residential and visual amenity; • Noise impact; • Specific highway safety; and • High quality agricultural land.

Policy Document	Topic	Policy
		Policy LP16: The Local Plan seeks to deliver and protect high quality environments throughout the district. The Proposed Development should: • Make a positive contribution to the local character and distinctiveness of the area; • Not adversely impact on the amenity of neighbouring users such as noise, light pollution, loss of privacy and loss of light; • Provide a safe environment and incorporate security measures to deter crime in accordance with Policy LP17; • Identify, manage and mitigate against any existing or proposed risks from sources of noise, emissions, pollution, contamination, odour and dust, vibration, landfill gas and protect from water body deterioration; and • Not result in any unreasonable constraint(s) or threaten the operation and viability of existing or nearby or adjoining businesses or employment sites.
Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036[12]	**Design**	**Policy 17: Design:** Requires that all waste management development secure high quality design. Of potential relevance to the Grid Connection is that development should be sympathetic to local character and history, including the built environment and landscape setting, retain or enhance important features and assets within the landscape, treescape or townscape and conserve views.
	Amenity	**Policy 18: Amenity Considerations:** Development must integrate effectively with existing or planned development. New development must not result in unacceptable adverse impacts on the amenity of existing occupiers of any land or property such as through risk to human health and safety, privacy, noise, light, air quality and light pollution, litter, flies, vermin and birds.
	Biodiversity	**Policy 20: Biodiversity and Geodiversity:** Provides highest level of protection for international sites and does not permit development that would harm national sites unless the benefits outweigh the impacts. For local sites permission only where the need and benefits clearly outweigh the loss and that the coherence of the local ecological network is maintained. A similar approach is taken to the potential for effects on habitats and species of local and principal importance.
	Historic Environment	**Policy 21: The Historic Environment:** Development proposals directly affecting a heritage asset or its setting must be accompanied by a Heritage Statement.
	Flood	**Policy 22: Flood and Water Management:** Development on sites known to be at risk from flooding will only be permitted following the successful completion of the sequential test followed by exceptions test if required and the submission of an FRA.

[12] Cambridgeshire County Council and Peterborough City Council. Minerals and Waste Local Plan 2036, Adopted July 2021

Policy Document	Topic	Policy
	Traffic and Footpaths	**Policy 23: Traffic, Highways and Rights of Way:** Waste management development will only be permitted where (of potential relevance to the proposed Grid Connection) any significant impacts in the transport network or highway safety can be cost effectively mitigated to an acceptable degree. Suitable provision must be made to protect public rights of way.
King's Lynn and West Norfolk Local Development Framework – Core Strategy[13]	**Landscape and Visual**	**Policy CS08:** Requires all new development in the borough to be of high-quality design. New development will be required to demonstrate its ability to (amongst other criteria) respond to the context and character of places in West Norfolk by ensuring that the scale, density, layout and access will enhance the quality of the environment. **Policy CS12:** This requires that proposals for development be informed by, and seek opportunities to reinforce the distinctive character areas and potential habitat creation areas identified in the King's Lynn and West Norfolk Landscape Character Assessment, the West Norfolk Econet Map and other character assessments. Development proposals should demonstrate that their location, scale, design and materials will protect, conserve and, where possible, enhance the special qualities and local distinctiveness of the area, gaps between settlements, landscape setting, distinctive settlement character, landscape features and ecological networks.
	Historic Environment	**Policy CS08:** states that new development will be required to demonstrate that it will protect and enhance the historic environment. **Policy CS12:** recognises the importance of the historic environment.
	Biodiversity	**Policy CS12:** states that the Council will protect designated sites and that development should seek to avoid, mitigate or compensate for any adverse impacts.
King's Lynn and West Norfolk Site Allocations and Development Management Policies Plan[14]	**Landscape and Visual**	**Policy DM15**: Proposals will be assessed against a number of factors including (amongst other criteria) visual impact. The scale, height, massing, materials and layout of a development should respond sensitively and sympathetically to the local setting.
	Water Environment	**Policy DM 20:** Renewable Energy which includes for its associated infrastructure states that applications will be assessed to determine whether the benefits are outweighed by the impacts with reference to watercourse, in terms of pollution. Policy DM 21 states that applications for development in zones 2 and 3 will need to be accompanied by a flood risk assessment which includes for climate change allowance.

[13] King's Lynn and West Norfolk Borough Council. Local Development Framework – Core Strategy 2011.
[14] King's Lynn and West Norfolk Borough Council. King's Lynn and West Norfolk Local Plan – Site Allocations & Development Management Policies 2016.

Policy Document	Topic	Policy
	Socio-economics	**Policy DM 20:** Renewable Energy which includes for its associated infrastructure states that applications will be assessed to determine whether the benefits are outweighed by the impacts with reference to tourism and other economic activity.
Norfolk Minerals and Waste Development Framework, Core Strategy and Waste Development Management Policies DPD 2010-2026[15]	**Biodiversity**	**Policy DM1 – Nature Conservation:** Development that would harm locally designated nature conservation and geodiversity site and/or habitats, species or BAP features will only be permitted if sufficient measures to mitigate harm are in place.
	Ground and Surface Water	**Policy DM3 – Ground and Surface Water.** Development should not adversely affect groundwater quality or resources and surface water quality and resources.
	Flooding	**Policy DM4 – Flood Risk.** The district councils' SFRA will be used to inform decisions for waste management facilities where appropriate. If no alternative available sites then applicants must apply the Sequential Approach on the site itself. An FRA will be required.
	Landscape and Townscape	**Policy DM8 – Design, Local Landscape and Townscape Character.** Development will only permitted if it will not harm landscape and townscape character including historic character and settlement patterns. Development will only be permitted within national or locally designated Historic Parks and Gardens, battlefields, conservation areas, listed building where the applicant can demonstrate it will not give rise to adverse impacts.
	Archaeology	**Policy DM9 – Archaeological Sites.** Applicant's whose proposals could potentially affect heritage assets or are in areas of high potential will have to prepare a desk-based assessment and where necessary undertake field evaluation. Development will only be permitted where it would not adversely affect the significance of heritage assets of national and/or regional importance.
	Transport	**Policy DM10 – Transport.** Planning applications for minerals or waste developments which generate an increase in traffic must be accompanied by a Transport Statement and if required by the Highway Authority a more detailed Transport Assessment and traffic Management Plan.

[15] Norfolk County Council. Norfolk Minerals and Waste Development Framework, Core Strategy and Waste Development Management Policies DPD 2010-2026. September 2011.

1.7 Guidance

The Holford Rules

1.7.1 The Holford Rules[16] comprises a set of guidelines for overhead line routeing. The Rules were prepared in 1959 by Lord Holford, the key principles of which focus on the achievement of good visual integration and protection of areas of high amenity value.

1.7.2 The original Rules and notes of clarification subsequently added by National Grid are as follows.

- **Rule 1:** Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the first line in the first place, even if the total mileage is somewhat increased in consequence.

  Note: Investigate the possibility of alternative routes, avoiding if possible the areas of the highest amenity value. The consideration of alternative routes must be an integral feature of environmental statements. Areas of highest amenity value are: AONB; National Parks; Heritage Coasts; and World Heritage Sites.

- **Rule 2:** Avoid smaller areas of high amenity value, or scientific interests by deviation; provided that this can be done without using too many angle towers i.e., the more massive structures which are used when lines change direction;

  Note: Some areas (e.g., Site of Special Scientific Interest (SSSI)) may require special consideration for potential effects on ecology (e.g., to their flora and fauna). Where possible choose routes which minimise the effects on the setting of areas of architectural, historic and archaeological interest including Conservation Areas, Listed Buildings, Listed Parks and Gardens and Ancient Monuments.

- **Rule 3:** Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers;

  Note: Where possible choose inconspicuous locations for angle towers terminal towers and sealing end compounds.

- **Rule 4:** Choose tree and hill backgrounds in preference to sky backgrounds wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees;

- **Rule 5:** Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees;

  Note: Utilise background and foreground features to reduce the apparent height and domination of towers from pan viewpoints. Minimise the exposure of numbers of towers on prominent ridges and skylines. Where possible avoiding cutting extensive swathes through woodland blocks and consider opportunities for skirting edges of copses and woods. Protecting existing vegetation, including

[16] National Grid. The Holford Rules.

woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.

- **Rule 6:** In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration or 'wirescape';

  Note: In all locations minimise confusing appearance. Arrange wherever practicable that parallel or closely related routes are planned with tower types, spans and conductors forming a coherent appearance; where routes need to diverge, allow where practicable sufficient separation to limit the effects on properties and features between the lines.

- **Rule 7:** Approach urban area through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of the undergrounding, for lines other than those of the highest voltage;

  Note: When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development. Alignments should be chosen after consideration of effects on the amenity of existing development and on proposals for new development. When siting substations take account of the effects of the terminal towers and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.

- **Supplementary Notes:**

  Residential Areas: Avoid routeing close to residential areas as far as possible on grounds of general amenity.

  Designations of County, District and Local Value: Where possible choose routes which minimise the effect on Special Landscape Areas, areas of Great Landscape Value and other similar designations of County, District or Local value.

  Alternative Tower Designs: In additional to adopting appropriate routeing, evaluate where appropriate the use of alternative tower designs now available where these would be advantageous visually, and where the extra cost can be justified.

1.7.3 As outlined in **Section 1.4** above, the core principles of the Holford Rules have been integrated into NPS EN-5.

National Grid Guidance

1.7.4 National Grid, the organisation responsible for the development and maintenance of the strategic high-voltage transmission network and other energy connections, has published the following guidance on their approach and principles concerning installation of new overhead and underground transmission lines:

- Our approach to the design and routeing of new electricity transmission lines (2012)[17]; and
- Our approach to options appraisal (2012)[18].

1.7.5 Both documents outline how National Grid identify the most appropriate location and technology for any new electricity connections, setting out how data is collected, analysed and consulted on in order to develop and appraise alternatives to determine the most appropriate solutions. Whilst National Grid would not be responsible for designing a proposed connection from the EfW CHP Facility the guidance and advice contained within these documents could be relevant should this voltage of connection be selected by the Applicant.

[17] National Grid. Our approach to the design and routeing of new electricity transmission lines. 2012.

[18] National Grid. Our approach to Options Appraisal. 2012.

2. Methodology

2.1 Study Area

2.1.1 The EfW CHP Facility would be located on the industrial estate, Algores Way in Wisbech, Cambridgeshire.

2.1.2 Following the identification of potential connection points and the most direct routes to these from the EfW CHP Facility (see methodology in **Section 2.2** below), a minimum Study Area of 5km extending either side of these most direct routes was adopted to identify the key constraints that could influence the creation and selection of a Grid Connection corridor. The Study Area was extended where impact pathways to those Receptors with the highest amenity value had the potential to extend beyond 5km, for example international sites designated for flora and fauna. The Study Area is illustrated on **Figure 2.1: Potential Points of Connection**.

2.2 Grid Connection corridor methodology

2.2.1 The approach to identifying the Grid Connection corridor followed the steps set out below. It assumed that the connection would be overhead unless the presence of any potentially sensitive Receptors were to suggest that consideration should be given to undergrounding as mitigation in line with the policy guidance contained within NPS EN-5.

Identification of potential connection points

2.2.2 A review of the electricity network in the area surrounding the EfW CHP Facility was undertaken to identify the closest connection points. This review was conducted with engagement from UK Power Networks (UKPN), the distribution provider for the area, and National Grid.

Identification of potential Grid Connection corridors

2.2.3 Once the potential connection points were confirmed, the most direct routes to these connection points was established as a starting point for defining the potential corridors, subject to avoiding the key settlement of Wisbech. This principle was in accordance with the Holford Rule 3 which suggests with other things being equal, choose the most direct line.

Review of environment and planning constraints

2.2.4 A 5km Study Area either side was applied to each of the direct routes identified. These routes were reviewed against environmental constraints, comprising of physical constraints and Receptors with the greatest amenity value (Holford Rules 1 and 2). This review determined if there were any Receptors likely to be significantly affected by a corridor routed in the areas defined in Step 2.

2.2.5 The review of environmental constraints considered the following Receptor groups, focusing on those Receptors with the highest amenity value.

- Landscape (AONBs, National Parks);
- Historic Environment (World Heritage Sites, Conservation Areas, Listed Buildings, Listed Parks and Gardens, Ancient Monuments);
- Biodiversity (Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsars, SSSIs, National Nature Reserves (NNRs), Ancient Woodland);
- Water Environment (Watercourses, Flood Risk zones); and
- Socio-economic (recreational routes, transportation networks, major settlements).

2.2.6 In addition, the review considered whether any of the potential corridor options would prevent the ability to deliver land use allocations defined in the relevant local authority Local Plans, or any additional pertinent policy aspirations.

2.2.7 As outlined in **Section 2.1** above, the Receptors of the highest amenity value were identified to a minimum 5km radius, but this was extended where impact pathways to those Receptors with the highest amenity value had the potential to extend beyond 5km.

2.2.8 The Receptors were identified using the following desk top information sources:

- MAGIC Map (Natural England);
- Flood Map for Planning (Environment Agency);
- Rights of Way Maps CCC and NCC; and
- Local Plan allocations.

2.2.9 A constraints plan was produced to illustrate the location of Receptors in the Study Area (see **Figure 2.2: Constraints Plan**).

Review of technical and cost constraints

2.2.10 The Grid Connection corridor options were reviewed to determine their technical feasibility. Consideration was given to the available capacity of the connection points, the ease of stepping up electricity to the desired outputs, the scale of the supporting infrastructure or upgrades required to facilitate the connections, and the timescales in which the connection providers would be able to facilitate the connections.

2.2.11 Cost considerations taken into account included the length of the connection and the infrastructure required to facilitate the potential connections.

2.2.12 Engagement with UKPN and National Grid was undertaken to determine the available capacity of the electricity network in the area surrounding the EfW CHP Facility. Both network operators confirmed the level of availability and identified connection points, and the technical feasibility and cost of constructing a connection to those points.

2.3 Preferred Route Alignment methodology

2.3.1 The first stage in the work to identify a Preferred Route Alignment was to confirm the assumptions and conclusions made as part of the Grid Connection corridor assessment. This was done by reviewing the consultee comments received during the first round of non-statutory consultation and by further engagement with UKPN to confirm previous conclusions about the POC.

2.3.2 Having confirmed the corridor and any potential amendments to it the next stage was to undertake a desk-based review of the land within the corridor in order to identify constraints which might affect the initial alignment. These might include:

- Environmental:
  - Areas of protected and/or important habitat;
  - Protected landscapes and/or areas of landscape quality;
  - Historic areas and buildings; and
  - Flood risk.
- Technical:
  - Existing infrastructure such as roads, rail, other power lines;
  - Ground conditions such as areas of marsh or bog; and
  - Buildability and maintainability including access.
- Land Use and land ownership:
  - Existing built-up areas, particularly residential areas;
  - Recreational areas, fishing, sports fields etc;
  - Historic or active landfills; and
  - Local Planning allocations and development proposals.

2.3.3 With regard to technical considerations, it was inevitable given the nature of the area within which the Grid Connection is proposed that infrastructure such as roads and electricity lines would be crossed. Good design practice suggests that wherever possible crossings should be made at right angles or close to right angles to reduce the length of oversail.

2.3.4 A constraints mapping exercise, similar to that undertaken to identify the preferred corridor, was undertaken to inform the engineering design consultants as to the relative sensitivity of the land within the corridor. Using this information and informed by the presumption to identify a route of lowest financial cost, respective of the constraints listed above, a desk top exercise was undertaken to identify one or more Preferred Route Alignment options. In identifying options consideration was also given to the Holford Rules,[19] the type of infrastructure proposed and the characteristics of the preferred corridor through which it would pass. The key Holford

[19] The full set of Rules and Supplementary Notes are set out in Section 1.5 above.

Rules relative to the selection of a Preferred Route Alignment within the Grid Connection Corridor are considered to be:

- **Rule 2:** Avoid smaller areas of high amenity value, or scientific interests by deviation; provided that this can be done without using too many angle towers i.e., the more massive structures which are used when lines change direction;
- **Rule 3:** Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers;

  Note: Where possible choose inconspicuous locations for angle towers terminal towers and sealing end compounds.
- **Rule 6:** In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration or 'wirescape'; and
- **Rule 7:** Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of the undergrounding, for lines other than those of the highest voltage.
- **Supplementary Notes:**

  Residential Areas: Avoid routing close to residential areas as far as possible on grounds of general amenity.

2.3.5 The initial alignment(s) represent a balance of the above rules and constraints. It/they was/were reviewed internally by the Applicant's environmental consultants and subjected to visits in the field. Initial discussions were also held with key consultees to understand any potential environmental and technical issues which they might identify. Key consultees in this context include:

- The Highways Authorities –CCC and NCC;
- National Highways;
- The Internal Drainage Boards (IDB) of Kings Lynn IDB and the Hundred of Wisbech IDB/Middle Level Commissioners;
- The Environment Agency; and
- FDC, CCC, NCC and KLWN, particularly Conservation/Historic Buildings and Areas.

2.3.6 As a result of the above a series of iterative amendments were commonly made to the initial alignment(s) to respond to constraints identified and matters raised. Each were reviewed for their acceptability when considered against the Holford Rules and planning policy until a final Preferred Route Alignment was identified.

2.3.7 The Preferred Route Alignment was then the subject of the Preliminary Environmental Information (PEIR) and formed part of statutory consultation.

2.4 Finalisation of the Preferred Route Alignment

2.4.1 Statutory consultation provides an opportunity for members of the public, landowners, and other statutory consultees to provide their opinion on the Preferred Route Alignment and POC. In the context of this project, two options were presented, the rationale for which is discussed below.

2.4.2 The first stage of the methodology to finalise the Grid Connection was to review consultation responses to see if they identified any technical, land use or environmental matters which would influence the route(s) and POC(s) presented at PEIR. This stage was supplemented by discussions with key Stakeholders concerning the POC and the Preferred Route Alignment. In addition, any environmental surveys which were due to complete after the PEIR were reviewed to see if they presented additional information which may influence the POC, and route chosen.

2.4.3 Whilst the methodology was focused on the identification of the POC and Preferred Route Alignment, a review of the means by which the connection would be made (UGC or OHL) was also undertaken. This review took into account:

- The introduction of any new environmental, land use or technical information presented during statutory consultation, or in parallel landowner discussion;
- The confirmed POC, and
- The comparative cost of either OHL or UCG to the confirmed POC.

2.4.4 The finalised Preferred Route Alignment to the confirmed POC and confirmed technology was then assessed as part of the EIA and is reported within the ES which accompanies the application.

3. Grid Connection Corridor Options Identification

3.1 Identification of potential connection points

3.1.1 A review of potential connection options within the proximity of the Grid Connection corridor was undertaken. The initial aim was to identify connection points closest to the EfW CHP Facility to minimise land-take and the potential environmental impacts of the Grid Connection.

3.1.2 UK Power Networks own and maintain the electricity network in the East of England, including Wisbech and the surrounding area. A review of UKPN's distribution network indicated that the closest substation connection points to the EfW CHP Facility were:

- 132kV substation at Walsoken (approximately 4km to the northeast); and
- 400kV/132kV substation at Walpole (approximately 10km to the north).

3.1.3 In addition to the UKPN operated substations, a National Grid 400kV overhead line approximately 6km to the east of the EfW CHP Facility was identified as a potential connection point.

3.1.4 An initial meeting was held with UKPN in August 2019 to discuss the available capacity of their network and the potential for a new connection. At the time, UKPN suggested that there was insufficient capacity to facilitate a connection at Walsoken DNO Substation, but there would be potential to connect to Walpole subject to the technical requirements of the EfW CHP Facility (see **Section 3.6** below). Walpole and the National Grid 400kV overhead line (POC) were taken forward during the first, non-statutory, round of consultation in 2020.

3.1.5 The potential connection points are illustrated in **Figure 2.1: Potential Points of Connection** to this report.

3.2 Corridor options identification

3.2.1 The EfW CHP Facility is located on the southern outskirts of Wisbech on the edge of an industrial estate, adjacent to Algores Way. The land to the south and immediate east of the EfW CHP Facility is currently undeveloped and therefore the Grid Connection was assumed to travel in either direction to avoid the built-up area of Wisbech to the north.

3.2.2 To access the 400/132kV connection at Walpole DNO Substation, which connects to the National Grid Transmission Network, two potential corridors were identified (**see Figure 2.1: Potential Points of Connection**):

- Corridor 1 - 132kV East; and
- Corridor 2 - 132kV West.

3.2.3 Corridor 3 - A third corridor option was identified running directly east from the main site to access the 400kV connection directly into the 400kV line to the east of Wisbech, a (400kV East) (see **Figure 2.1: Potential Points of Connection**).

3.2.4 All three potential corridors assumed that the Grid Connection would approach the EfW CHP Facility along the outskirts of the industrial estate in accordance with the principle of Holford Rule 7.

3.2.5 A description of the three potential connection corridors is provided below.

132kV East

3.2.6 Corridor 1 - The 132kV East corridor leaves the main site to the east, running along New Bridge Lane on the southern edge of the industrial estate. The corridor then turns north at the A47, broadly following the route of the A47 along the eastern edge of Wisbech town. This corridor continues north, crossing agricultural land and minor roads before reaching Walpole DNO Substation. The corridor is located close to Walton Highway, and it includes within it a number of isolated dwellings as well as a solar farm. The corridor is approximately 11km in length from the EfW CHP Facility in Wisbech to Walpole.

132kV West

3.2.7 Corridor 2 - The 132kV West corridor leaves the EfW CHP Facility to the west, running along New Bridge Lane before crossing Cromwell Road and the River Nene. The corridor skirts the western edge of Wisbech before heading in a northeast direction towards Walpole DNO Substation. The corridor would cross over the A1101 and a number of minor roads. The villages of Leverington and Ingleborough are located within and adjacent to this corridor. This corridor option would be approximately 12km in length.

400kV East

3.2.8 Corridor 3 - The 400kV East corridor shares a common corridor with Corridor 1 until it reaches the A47. At this point, it continues east beyond the A47 across agricultural land until it reaches the existing 400kV overhead line. The villages of Emneth Gautree and Emneth Hungate are located to the south of the corridor, and Marshland St James further to the east. This corridor option measures approximately 6km in length with a width increasing towards the existing 400kV Overhead Line (OHL). This is because National Grid did not suggest a single defined end point for a connection.

3.2.9 A further 400kV corridor option running to the west and north of Wisbech was identified, however it was not considered appropriate to take this option forward for environmental, technical and cost reasons, because it was significantly longer than the 400kV East option (10km compared to 6km). As this corridor would wrap around three sides of Wisbech, it was clear that the impacts on the environment, including the local population, would be potentially greater than the most direct route to the east. This decision followed the principle of Holford Rule 3 to take the most direct line.

3.3 Initial review of environmental and planning constraints

3.3.1 An initial review of the planning and environmental constraints for the three corridor options is set out in the below. The information in this Table, **Table 2A.2 Environmental and Planning Appraisal** is supported by the Constraints Plan provided in **Figure 2.2: Constraints Plan** to this report**.**

3.3.2 The appraisal of environmental and planning constraints took account of the following design assumptions defined in the EIA Scoping Report:

- 132kV OHL would be installed on wooden poles with a maximum height of 20m; and
- 400kV OHL would be installed on steel pylons with a maximum height of 49m.

Table 2A.2 Environmental and Planning Appraisal

Topic	132kV (East) Corridor 1	132kV (West) Corridor 2	400kV (East) Corridor 3
Landscape and Visual	No National Parks or AONBs are located within the Study Area. The corridor includes a Sustrans cycle route.	No National Parks or AONBs are located within the Study Area. The Study Area includes two sections of the Nene Way Long Distance Path and the Sustrans cycle route.	No National Parks or AONBs are located within the Study Area. The Study Area includes a Sustrans cycle route.
Historic Environment	No World Heritage Sites or Listed Parks and Gardens are located in the Study Area. Peckover House Registered Park and Garden is located in the Study Area, 2km to the north of the most direct line. Wisbech Conservation Area is located approximately 1.3km to the north of the most direct line and Elm Conservation Area 0.7km to the south. One Scheduled Monument would be located within the Study Area, the Cross in All Saints churchyard at Walsoken, approximately 2km to the	No World Heritage Sites or Listed Parks and Gardens are located in the Study Area. Peckover House Registered Park and Garden is located 2km to the north of the most direct line. Wisbech Conservation Area is located approximately 700m to the north of the most direct line and Elm Conservation Area 0.7km to the south. Three Scheduled Monuments would be located approximately 0.7km to the east of the most direct line in Leverington: Roman Bank ancient sea defence, Cherry Tree Hill Round	No World Heritage Sites or Listed Parks and Gardens are located in the Study Area. Peckover House Registered Park and Garden is located 2km to the north of the most direct line. Wisbech Conservation Area is located approximately 1.3km to the north of the most direct line and Elm Conservation Area 0.7km to the south. One Scheduled Monument would be located in within the Study Area, the Cross in All Saints churchyard at Walsoken,

Topic	132kV (East) Corridor 1	132kV (West) Corridor 2	400kV (East) Corridor 3
	west of the most direct line. One Grade I and one Grade II* listed building are located in this Study Area in Elm, approximately 0.9km and 0.7km respectively to the south of the most direct line. Additional Grade I and II* buildings are located in the centre of Wisbech, 1.3km to the north. The majority of the Grade II listed buildings located within the Study Area are located within Wisbech approximately 1.3km to the north of the most direct line. Additional Grade II listed buildings are scattered in the Study Area.	Barrow and Rabbit Hill Round Barrow. Two Grade I listed buildings are located in Leverington, approximately 0.7km to the east of the most direct line. Two Grade II* listed buildings are located in Wisbech St Mary, approximately 1km to the south of the most direct line, and one close to Leverington, immediately adjacent to the most direct line. Additional Grade I and II* buildings are located in the centre of Wisbech, 1.3km to the north. The majority of the Grade II listed buildings located within the Study Area are located within Wisbech approximately 1.3km to the north of the most direct line. Additional Grade II listed buildings are scattered in the Study Area, including within Leverington.	approximately 2.5km to the north of most direct line. One Grade I and one Grade II* listed building are located in this Study Area in Elm, approximately 0.9km and 0.7km respectively to the south of the most direct line. Additional Grade I and II* buildings are located in the centre of Wisbech, 1.3km to the north. The majority of the Grade II listed buildings located within the Study Area are located within Wisbech approximately 1.3km to the north of most direct line. Additional Grade II listed buildings are scattered in the Study Area including within Emneth, within 0.5km of the most direct line.
Biodiversity	The nearest European Sites are located approximately 7.5km to the south of the most direct line (Nene Washes SAC, SPA and Ramsar) and approximately 10km to the north of Walpole DNO Substation (the Wash Ramsar, The Wash SPA and The Wash & North Norfolk Coast SAC). No SSSI's, NNRs or areas of Ancient Woodland are located in the Study Area.	The nearest European Sites are located approximately 7.5km to the south of the most direct line (Nene Washes SAC, SPA and Ramsar) and approximately 10km to the north of Walpole DNO Substation (the Wash Ramsar, The Wash SPA and The Wash & North Norfolk Coast SAC). No SSSI's, NNRs or areas of Ancient Woodland are located in the Study Area.	The nearest European Sites are located approximately 7.5km to the south of the most direct line (Nene Washes SAC, SPA and Ramsar) and approximately 17km to the north (the Wash Ramsar, The Wash SPA and The Wash & North Norfolk Coast SAC). No SSSI's, NNRs or areas of Ancient Woodland are located in the Study Area.

Topic	132kV (East) Corridor 1	132kV (West) Corridor 2	400kV (East) Corridor 3
Water environment	The Study Area is located in flood zones 1, 2 and 3[20]. The most direct line would be partially located in an area benefitting from flood defences. This corridor would not cross the River Nene.	The Study Area is located in flood zones 1, 2 and 3[21]. All floodplain is undefended. The most direct line would cross the Nene River in two locations, one immediately to the west of Wisbech beyond Cromwell Road, and the second to the north of Wisbech as the corridor heads northeast towards Walpole.	The Study Area is located in flood zones 1, 2 and 3[22]. The most direct line would be partially located in an area benefitting from flood defences. This corridor would not cross the River Nene.
Socio-economic	The most direct line would run along the southern outskirts of Wisbech, and route along the eastern edge of Wisbech towards Walpole. Elm is located approximately 0.2km to the south of the most direct line, West Walton 0.5km to the west and Walton Highway is located approximately 0.5km to the east of the most direct line. The A47 is located immediately to the east of the most direct line at the closest point. Sustrans cycle route 63 which crosses the A47 at Elm roundabout, and Sustrans cycle route 1 to the west of Walton Highway.	The most direct line would run along the southern outskirts of Wisbech, and route along the western edge of Wisbech towards Walpole. The corridor would cross through the outskirts of Leverington. This most direct line would cross the B198/Cromwell Road, and the A1101. The Nene Way Long Distance Trail passes through the Study Area on two occasions, one immediately to the west of Wisbech beyond Cromwell Road, and the second to the north of Wisbech as the corridor heads northeast towards Walpole. A further cycle corridor, although not part of the National Cycle Network would cross the most direct line to the north of Leverington	The most direct line would run along the southern outskirts of Wisbech. The villages of Elm and Emneth would be located approximately 0.5km to the south of the most direct line. The Study Area includes the A47 to the south of Wisbech. Sustrans cycle route 63 which crosses the A47 at Elm roundabout,
Planning	The Study Area includes Strategic Allocations in the Fenland Local Plan (2014) immediately to the south of the main site, and to the east of	The Study Area includes Strategic Allocations in the Fenland Local Plan (2014) immediately to the south of the main site, and to the west of Wisbech.	The Study Area would pass through Strategic Allocations in the Fenland Local Plan (2014) immediately to the south of the main

[20] Flood Map for Planning (2020).
[21] Flood Map for Planning (2020.
[22] Flood Map for Planning (2020).

Topic	132kV (East) Corridor 1	132kV (West) Corridor 2	400kV (East) Corridor 3
	Wisbech. Land allocated in the King's Lynn & West Norfolk Local Plan (2016) is also located on the eastern outskirts of Wisbech. Land identified for the potential Wisbech Garden Town is partially located in the Study Area, beyond the location of the Fenland and King's Lynn & West Norfolk strategic allocations.	Land identified for the potential Wisbech Garden Town is located in the Study Area, beyond the location of the Fenland strategic allocations.	site, and to the east of Wisbech. Land allocated in the King's Lynn & West Norfolk Local Plan (2016) is also located on the eastern outskirts of Wisbech. Land identified for the potential Wisbech Garden Town would be located adjacent to this corridor near the A47/Elm Roundabout.

Note: All measurements have been provided from the centre of each potential corridor which would be the most direct route. Ultimately the chosen alignment could be closer or further away depending upon its location within the corridor.

3.3.3 The initial review of the environmental and planning constraints sought to identify a preference between the two 132kV options to take forward to the EIA Scoping stage alongside the 400kV option. At this point, technical and cost constraints had not been considered.

3.3.4 The initial assessment of planning and environmental constraints identified a preference for the 132kV East corridor. The reasons for selecting the 132kV East corridor in preference to the 132kV West corridor are set out below:

i. The 132kV East corridor is shorter and more direct than the 132kV West corridor, which follows the Holford Rule 3 principle which favours the most direct route when all things are equal.

ii. Whilst both corridors were crossed by Sustrans cycle route, the 132kV West corridor has potentially greater impacts on users of the Nene Way Long Distance Trail which crosses the corridor at two locations.

iii. The 132kV East corridor 1 has fewer historic environmental Receptors in comparison to the 132kV West corridor which would pass close to Grade I, II* and II listed buildings near Leverington and Gorefield.

iv. The 132kv West corridor 2 would require two crossings of the River Nene which has a greater potential for effects on the water environment than the east option.

v. Both corridor options fall within land currently identified for the potential Wisbech Garden Town however the 132kV East corridor 1 would provide the ability to identify a route on the eastern side of the A47 to avoid an overlap with the potential Garden Town. The 132kV East corridor 1 would be required to lengthen substantially to route around the potential Garden Town, which would potentially increase the extent of environmental impacts caused by a longer route.

vi. Both corridor options cross areas of Flood Zones 2 and 3. However, all floodplain within the 132kV West corridor is undefended whilst the majority of floodplain within the 132kV East benefits from flood defences.

3.3.5 No discernible biodiversity impacts were noted when comparing the two corridor options.

3.3.6 On the basis of the reasons outlined above the 132kV West corridor 2 was not taken any further in the appraisal process. The 132kV East corridor 1 was taken forward for further appraisal, together with the 400kV East corridor 3.

EIA Scoping

3.3.7 In December 2019 the Applicant submitted a request to the Secretary of State for an EIA Scoping Opinion to determine the scope of the EIA and the content of the ES which would be submitted with the DCO Application. At this time, two corridor options (132kV East corridor 1 and 400kV East corridor 3) remained under consideration. These two options were included within the scoping boundary and factored into the scope of the EIA for consideration by the Secretary of State[23]. The Secretary of State published their EIA Scoping Opinion in January 2020. This took account of the two options for the proposed Grid Connection.

Phase 1 Non-statutory consultation

3.3.8 A copy of the Applicant's Scoping Report and the Secretary of State's Scoping Opinion was published as part of the Phase 1 non-statutory consultation. This consultation ran between 16 March 2020 and 4 May 2020 and sought comments on the proposals, including both Grid Connection corridor options. One comment was received during this consultation that raised concerns regarding the visual impact of a Grid Connection and the impact of electromagnetic fields. A second comment was received from Anglian Water which asked that the location of its infrastructure be taken into consideration when identifying the preferred corridor and in any subsequent work to identify the preferred alignment. No comments were received that suggested a preference for one Grid Connection corridor over another.

3.4 Technical and cost feasibility

3.4.1 The Applicant engaged with UKPN and National Grid, who are responsible for the 132kV and 400kV connection options respectively.

132kV Connection (UKPN)

3.4.2 Following the initial meeting with UKPN in August 2019 in which it was agreed that there could be a potential connection point at Walpole, the Applicant submitted an application for connection of generation to UKPN's Major Connections Team in October 2019. This application enabled UKPN to undertake an initial assessment of the Applicant's proposal in order to advise on the proposed approach to a connection point at Walpole DNO Substation.

3.4.3 Between October 2019 and December 2019, the Applicant provided further information to UKPN to support the development of a connection offer. In mid-December 2019, UKPN confirmed a point of connection at Walpole DNO

[23] MVV Environment Ltd. Medworth Energy from Waste Combined Heat and Power Facility – EIA Scoping Report. 2019

Substation and provided the initial technical requirements and costs for both contestable and non-contestable works.

3.4.4 Further discussions were held between the Applicant and UKPN between December 2019 to January 2020 to determine the precise location of the connection point at Walpole DNO Substation and to ensure that the technical requirements of the initial offer suited the needs of the project. In late January 2020, UKPN issued a Connections Estimate offer to the Applicant which specified the following:

- Maximum export capacity of 62MW;
- Point of Connection located on the southern boundary of Walpole DNO Substation.
- New extra high voltage plant and switch gear; and
- 132kV cable duct from the EfW CHP Facility to Walpole DNO Substation.

3.4.5 UKPN estimated the cost for the works at £16.1m.

National Grid (400kV)

3.4.6 In addition to the potential connection to the Walpole DNO Substation the Applicant also considered an alternative connection directly to the 400kV line to the east of the EfW CHP Facility.

3.4.7 An initial meeting was held with National Grid in October 2019 to introduce the project and discuss potential connection options. National Grid confirmed that the Applicant had two options; to pursue a feasibility study to determine the suitability of connection (with no connection guaranteed) or proceed directly to a connection application. A connection application was subsequently submitted to National Grid in December 2019, followed by further information at the request of National Grid in January 2020.

3.4.8 National Grid responded to the connection application in February 2020 and advised that it would be technically feasible to connect to the 400kV overhead line via a double 400kV circuit, but this would require extensive transmission reinforcement works and enabling works including:

- Construction of a new 4 bay double busbar air insulated switchgear (AIS) substation;
- Modification to an existing and provision of an additional overhead line tension tower;
- 400kV cable duct to the EfW CHP Facility; and
- Associated protection and control works at Walpole and Burwell Main substations.

3.4.9 National Grid provided an indicative cost for these works of between £23m - £27m.

3.4.10 Based on the extensive reinforcement works required to transfer approximately 60MW to the 400kV overhead line, National Grid advised that this option would not be economical to construct.

3.5 Selection of the preferred Grid Connection corridor

3.5.1 The 132kV East corridor 1 and 400kV East corridor 3 options were reviewed from an environmental, technical, and cost perspective and subject to extensive engagement with UKPN and National Grid to determine the most appropriate Grid Connection corridor. Taking account of these factors, the 132kV (East) corridor 1 was selected as the preferred option for the following reasons:

i. Steel pylons with a maximum height of 49m for a400kV connection would be more visually intrusive than the 132kV wooden pole option with a maximum height of 20m. Whilst the 132kV OHL would be longer in length than the 400kV OHL, the zone of theoretical visibility is substantially reduced meaning that fewer Receptors would have the potential to be affected by the connection infrastructure.

ii. The presence of, and distance to, historic assets is similar for both corridor options, however the increased height of the steel pylons for a 400kV connection has the potential to impact upon the setting of heritage assets to a greater extent than the shorter wood poles used for the 132kV connection.

iii. Whilst neither corridor is located in an area designated for biodiversity reasons, there are SPA's and Ramsar's located within a 20km radius of both potential corridors. The greater height of the 49m OHL for a 400kV connection may have the potential to result in an increased collision risk to certain bird species.

iv. Both corridors are located in Flood Zones 1, 2 and 3. Whilst the 132kV corridor is greater in length than the 400kV corridor (10km compared to 6km) and thus covers a wider area of flood plain, both corridors benefit from flood defences and are not dissimilar in terms of flood risk.

v. The foundations for wooden poles associated with the 132kV corridor are expected to be shallower and less intrusive than those required to construct the taller steel pylons associated with the 400kV corridor. Therefore, the 132kV corridor reduces the potential risks to groundwater and surface water Receptors during the construction phase.

vi. Extensive transmission reinforcement works would be required for a 400kV connection, including works at two offsite locations; Walpole Substation and Burwell Main Substation, compared to the 132kV connection which would limit works to Walpole DNO Substation.

vii. The cost of the works required to facilitate a 400kV connection is significantly more than the 132kV option and National Grid consider that it would not be economical to pursue this option.

3.5.2 As a consequence of the above a connection to the National Grid 400kV overhead line (400kV East corridor 3) was discounted.

3.6 The reintroduction of an alternative point of connection

3.6.1 **Section 3.1** of this report references a meeting with UKPN in August 2019 at which it was initially confirmed that there was insufficient capacity to facilitate an unconstrained connection at Walsoken DNO Substation, thus leading to the selection of Walpole as one of two initial POC (along with the National Grid 400kV overhead line).

3.6.2 Subsequent to initial discussions, further correspondence and meetings were held with UKPN to understand whether a constrained connection might be possible and the extent of any capacity restrictions due to curtailment, with responses suggesting that the restrictions would be limited.

3.6.3 Prompted by these continued discussions a detailed curtailment study was commissioned from UKPN to understand the extent of any capacity restrictions. This study and the Applicant's technical review did not report in sufficient time ahead of statutory consultation for the Applicant to consider its conclusions such that it was considered prudent to consult on two POC options.

Implications for the selection of the preferred Grid Connection corridor

3.6.4 The preferred Grid Connection corridor extends first east and then in a generally northerly direction to Walpole. In so doing the corridor as defined in the EIA Scoping Report passes and includes the Walsoken DNO Substation (the potential, alternative POC). It is concluded that the same corridor would have been selected irrespective of whether Walpole or Walsoken POCs were selected albeit that the corridor would have terminated at or near to Broadend Road had the initial corridor optioneering focused upon Walsoken as opposed to Walpole. This conclusion is drawn due to the common set of constraints prevalent to both POCs.

4. Grid Connection Preferred Route Alignment Identification

4.1 Identification of initial alignment

4.1.1 The Grid Connection alignment is required to exit the EfW CHP Facility Site and progress in an easterly and then northerly direction to the POC. At all times, the Study Area for the alignment is fixed by the extent of the preferred Grid Connection corridor. Whilst the preferred Grid Connection corridor was selected because it represented the best option in terms of environment and technical constraint, deliverability and cost, it is nevertheless prudent to revisit the factors that might influence the identification of the initial alignment.

4.1.2 The consideration of routes worked on the assumption that the majority of the connection could be overhead. This approach was informed by NPS EN-5 paragraph 2.8.9 which provides policy guidance for the consideration of whether a connection should be undergrounded. It advises that placing a connection underground may be more appropriate in landscapes of natural beauty such as National Parks, Areas of Outstanding Natural Beauty (AONB) or residential areas but that the costs of undergrounding relative to overhead, and the other environmental and archaeological consequences that might be of issue should also be a factor when arriving at a decision.

4.1.3 The preferred Grid Connection corridor does not pass through a landscape designated for its natural beauty nor through any residential areas. On this basis, MVV began with the assumption that a totally underground connection would not be necessary.

4.1.4 Consistent with the methodology outlined in **Section 2** constraints within, and in influencing distance of, the preferred Grid Connection corridor were mapped. The results of this mapping are set out in **Figure 4.1: 132kV Grid Connection East, Constraints Map**.

4.1.5 The constraints map enables the Grid Connection engineering design consultants to identify a route based on the avoidance of hard constraints (such as the oversail of dwellings or settings of listed buildings) and minimisation of soft constraints (such as existing infrastructure). When designing the route, attention is also given to technical best practice and to the Holford Rules with the design seeking to achieve the shortest route, minimise angles of deviation and where infrastructure needs to be crossed, to do so for the shortest distance.

4.1.6 The result of the initial design exercise is illustrated in **Figure 4.2: 132kV Grid Connection East Alternative Routes**. This exercise included for a sub-option and for a common option to underground the connection from the EfW CHP Facility Site to a point east of Elm High Road. The performance of the initial option and sub-options is considered in **Table 2A.3 Environmental and Planning (Land Use) Appraisal** below.

Table 2A.3 Environmental and Planning (Land Use) Appraisal

Topic	Initial Option OHL1	Sub-option OHL2	Sub-option UGC
Landscape and Visual	The Option would not cross or be in proximity to any landscapes designated for their natural beauty. The Option would pass to the east of Wisbech and in particular properties facing east on Sparrowgate Road and Burrettgate Road.	The Option would not cross or be in proximity to any landscapes designated for their natural beauty. The Option would not pass through or in close proximity to settlements, passing to the west of Walton High Road.	This Option would be underground such that it would not have any landscape and visual impact once operational.
Historic Environment	The Option would pass close by one listed building close to the junction of Burrettgate Road/Burrett Road and Sparrowgate Road together with a second on Walpole Bank. The Option would not pass by conservation areas.	The Option would not pass close by any listed buildings or conservation areas.	There are no listed buildings or conservation areas in proximity to the Option and there would be no potential impacts upon the setting of historic assets once operational. There is the potential for effects upon unrecorded archaeology as a result of the excavations necessary to install the cable.
Biodiversity	The Option would cross areas of woodland/orchards north of Meadowgate Lane and also either side of Sparrowgate Road/ Black Bear Lane. It would cross a number of ditches with the potential to support Water Vole, Otter and Great Crested Newt.	The Option would cross a number of ditches with the potential to support Water Vole, Otter and Great Crested Newt. It would cross orchards on Biggs Road and Dixon's Drove although this would be at their narrowest point.	The Option would avoid areas of woodland and existing orchards. It would cross IDB ditches which may provide habitat for Water Vole, Otter and Great Crested Newt.
Water environment	The Option would predominantly cross flood zones 1, and 2 south of Lynn Road and flood zone 3 from that point north.	The Option would cross predominantly flood zone 3 from a point north of Meadowgate Lane.	The Option would be cross land which is predominantly Flood Zone 1. It would cross IDB ditches.
Socio-economic	Sustrans cycle route 63 which crosses the A47 at Elm High Road roundabout, and Sustrans cycle route 1 to the west of Walton Highway would be crossed. The Option would also oversail commercial properties	Sustrans cycle route 63 which crosses the A47 at Elm High Road roundabout, and Sustrans cycle route 1 to the west of Walton Highway would be crossed. The Option would oversail few	Sustrans cycle route 63 which crosses the A47 at Elm High Road roundabout would be crossed but the crossing would be underground. Elm Hall Hotel would also be crossed underground.

Topic	Initial Option OHL1	Sub-option OHL2	Sub-option UGC
	including nurseries east of Burrettgate Road and substantial areas of commercial orchard.	commercial properties and orchards.	
Planning	The Option would be immediately adjacent to the King's Lynn & West Norfolk Local Plan (2016) Allocation F3.1. This allocation is allocated for 550 dwellings. The Opiton would cross the south eastern corner of the Wisbech Strategic Allocation in the Fenland Local Plan. Land identified for the potential Wisbech Garden Town is partially located in the area, beyond the location of the Fenland and King's Lynn & West Norfolk strategic allocations.	The Option would not pass over or in close proximity to land allocated for development within the Fenland or Kings Lynn & West Norfolk Local Plans.	The Option would pass through land identified within the Fenland Local Plan as a Broad Location for Growth, comprising commercial and residential development.

4.1.7 In addition to the Environmental and Planning (Land Use) appraisal the connection was reviewed for its ease of construction and operational maintenance and for any other technical matters that may influence the evolving design.

4.1.8 The following was identified for OHL1:

- It would pass over the Elm High Road junction and Elm Hall hotel as an overhead line requiring a long span with high towers;
- It would cross multiple 11kV (4 no.) and 33kV (1 no.) OHL and it would cross a 132kV OHL and two 400kV lines at an oblique angle close to Walpole DNO Substation.

4.1.9 The following was identified for OHL2:

- It would cross multiple 11kV (7 no.) and 33kV (3 no.) OHL, one 132kV OHL and potentially one 400kV OHL close to the point at which it would connect to the Walpole POC.

4.2 Selection of the preferred initial alignment and recommendations for amendment

4.2.1 The two initial options for an OHL and the proposal to underground the first part of the connection up to a point at Elm High Road were reviewed in light of the

considerations outlined above. Whilst the undergrounding of the connection would be approximately six times more expensive per linear kilometre than OHL it was recognised that the Adopted Fenland Local Plan 2014 includes proposals for business and potentially residential development south-east of Wisbech. In view of this committed allocation and the technical difficulties that could arise from the crossing of the Elm High Road/A47 junction with OHL, the option of an underground cable to a point beyond Elm High Road was confirmed.

4.2.2 As initially proposed OHL1 could have been reduced in length such that it could have started beyond the Elm High Road/A47 junction rather than before it. However, given that the results of the assessment into its suitability concluded that it would pass very close to Allocations in the Kings Lynn and West Norfolk Local Plan and that it would also be close to existing residential properties, and cross commercial properties and significant areas of commercial orchard, it was discounted in favour of OHL2, whilst accepting that OHL1 would potentially be the cheaper of the two OHL options.

4.2.3 The initial design for OHL2 included a western deviation around the Rose and Crown Solar Farm. The need for this deviation was reviewed with consideration given to alternative deviations to the east of the solar farm (see **Figure 4.3: 132kV Grid Connection Northern Alignment Options avoiding the Solar Farm**). Each deviation option was reviewed for its Environmental and Planning (Land Use) performance. **Table 2A.4 Environmental and Planning (Land Use) Appraisal Northern Options** below summarises the relative performance of each option.

Table 2A.4 Environmental and Planning (Land Use) Appraisal Northern Options

Topic	Route 1	Route2	Route 3	Route 4
Landscape and Visual	No cycle routes or long distance footpaths cross any of the 4 routes. Not located in any designated landscapes. The closest property to the purple route is located off Walpole Bank Road (165m). This is a similar distance to the existing 400kV overhead line.	Route 2, 3 and 4 runs closer to two residential properties (Thornleigh Cottage and Folgate Farm) than purple. Existing 400kv overhead line lies within 100m of both properties.		

Topic	Route 1	Route2	Route 3	Route 4
Historic Environment	c. 495m from Greens Cottage Grade II listed building	c. 285m from Greens Cottage Grade II listed building	c. 310m from Greens Cottage Grade II listed building	c. 310m from Greens Cottage Grade II listed building
Biodiversity	No designations on any route. All cross predominantly agricultural habitats. Ditches would need to be surveyed to understand any specific presence for Water Vole, Otter or Great Crested Newt.			
Water Environment	All routes are located in Flood Zone 2, and within an area benefitting from flood defences.			
Socio-economic	All routes are located in a rural setting with scattered properties, distant from any settlements.			
Planning	There is no land allocated in the King's Lynn & West Norfolk Local Plan (2016) allocated for development along any of the four routes. No recent applications had been received for new development with the exception of a proposed solar farm on land west and south of Walpole DNO Substation (20/01508/FM).			

4.2.4 Having reviewed the northern route options it was considered that they offered no additional environmental or land use improvements over that originally selected. Furthermore, there were no distinctive technical considerations which favoured one over the other. The exercise was also superseded by the information received regarding the proposals for a new solar farm on land adjacent to the Walpole DNO Substation. It was therefore necessary to revisit the wider approach to accessing the POC and it was concluded that it would be preferable to underground the final section of the Grid Connection. This would have the benefit of avoiding the proposed solar farm (for which planning consent was granted on 15 January 2021) and it would also reduce the convergence of OHL lines into the substation which had been identified during field surveys undertaken to inform the possible selection of alternative routes as set out in **Table 5.2 Environmental and Planning (Land Use) Appraisal Northern Options** above.

4.3 Identification of an alternative point of connection

4.3.1 **Section 3.6** referred to the re-introduction of the Walsoken DNO Substation as a possible, alternative point of connection subject to the level of constraint.

4.3.2 Three alternative Grid Connection route alignment options to connect to Walsoken DNO Substation were therefore identified. The first option was proposed as wholly underground by UKPN with options 2 and 3 employing the common UGC connection from the EfW CHP Facility Site to the point west of Elm High Road. The options considered are identified in **Figure 4.4: Walsoken Alternative Grid Connection Options** and summarised below:

- Alternative Grid Connection 1 – Suggested by UKPN and running underground along Algores Way, Weasenham Lane, Ramnoth Road, Mansell Road, Arles Avenue, Meadowgate Lane, Sandy Lane and Broadend Road to Walsoken DNO Substation;
- Alternative Grid Connection 2 – Following the same underground route considered for Walpole until the Elm Hall roundabout, but remaining on the western side of the A47 underground to Broadend Road and then to Walsoken DNO Substation; and
- Alternative Grid Connection 3 – Following the same underground route considered for Walpole but with termination of the OHL element at Broadend Road with the connection running underground along Broadend Road and under the A47 to the Walsoken DNO Substation.
- A review of each alternative was undertaken the results are summarised in **Table 2A.5 Environmental and Planning (Land Use) Appraisal Walsoken Options** below.

Table 2A.5 Environmental and Planning (Land Use) Appraisal Walsoken Options

Topic	Alternative Grid Connection 1	Alternative Grid Connection 2	Alternative Grid Connection 3
Landscape and Visual	The Alternative would be wholly underground therefore landscape (townscape) and visual effects would be during the construction phase only. By following existing highways no landscape resources would be lost.	The Alternative would be wholly underground therefore landscape (townscape) and visual effects would be during the construction phase only. Construction would run along the western side of the A47 on land in agricultural use including orchards, and plantation woodland. Excavation could lead to the limited loss of trees.	The Alternative beyond the Walpole Underground Route would be overhead. It would cross agricultural land bounded by ditches. There are no trees along the alignment and no properties in close proximity to the line.
Historic Environment	Passing through the eastern edge of Wisbech the Alternative would avoid the conservation area. Excavations in the highway are unlikely to disturb unrecorded archaeological features. The option would not pass through the setting of any listed buildings.	There are no listed buildings or conservation areas in proximity to the Alternative. Running parallel to the A47 it is assumed that the potential to disturb unrecorded archaeological features is unlikely.	There are four listed buildings to the south, on Meadowgate Lane but these would be screened from the option by substantial tree screening.
Biodiversity	Passing through the eastern edge of Wisbech the option would be wholly underground and	This underground Alternative would cross a small number of ditches, orchard and plantation woodland.	Approximately 10 ditches and cultivated land- arable would be crossed with the

Topic	Alternative Grid Connection 1	Alternative Grid Connection 2	Alternative Grid Connection 3
	follow existing highways. There is unlikely to be any loss of biodiversity.		potential to support Water Vole, Otter and Great Crested Newt.
Water environment	No ditches or watercourse would be crossed by this Alternative which would be constructed in an urban setting following the existing highway network.	This underground Alternative would cross two IDB ditches and would be located within Flood Risk Zones 1, 2 and 3.	The Alternative would cross 3 IDB ditches and would be in an area zoned predominantly as Flood Risk Zone 3.
Socio-economic	The Alternative would follow the existing highway network running through the industrial estate. Construction activities would take place past approximately 200 residential properties and could create noise and vibration in residential areas and close to schools and colleges such as the Thomas Clarkson and Meadowgate Academies.	The Alternative would run parallel to the A47 along the edge of orchards and some plantation woodland assumed to follow existing access tracks. Construction may restrict access to the boundaries of these landholdings but there should be few effects once operational.	The Alternative would cross agricultural land. The poles would not significantly affect the ability of continued farming operations. No schools or businesses in proximity to the Alternative.
Planning	Following the existing highway the Alternative would cross the East Wisbech Strategic allocation. The allocation sits astride the Fenland and Kings Lynn and West Norfolk boundaries and would accommodate approximately 1450 dwellings. A request for a scoping opinion has been received by Fenland for a mixed use, residential -led development. F/YR19/0199/SCOP for a site which includes this allocation.	There are no Local Plan allocations or significant planning applications that would be crossed by this Alternative.	There are no Local Plan allocations or significant planning applications that would be crossed by this Alternative.

4.3.3 The review of environmental and planning (land use) suggested that each option had strengths or weaknesses often in different topics but that no option was fundamentally inappropriate. Alternative Grid Connection 3 was considered to be likely to give rise to fewer effects during construction in that it would not inconvenience local residents to the same extent as Alternative 1 and would avoid areas of orchard and plantation woodland which would be impacted by Grid Connection Alternative 2.

4.3.4 Consideration was also given to the relative costs of the options with the assumption that undergrounding can be approximately six times more expensive than overhead. On this basis and given that the relative lengths of each alternative would be 4-5km, the alternative which included an element of overhead cable (approximately 1.5km) would be the most cost effective. However, Alternative Grid Connection 3 was ultimately chosen based upon its environmental performance and was consulted on at statutory consultation.

5. Grid Connection Preferred Route Alignment and Technology Choice

5.1.1 Two route alignments for the Grid Connection, each connecting to a different POC (at the Walpole and Walsoken DNO Substations) were consulted on at statutory consultation. Following a review of the consultation responses, the Applicant sought to select the POC which it would take forward for final technical design, environmental assessment and ultimately submission.

5.2 Consultation responses

5.2.1 The first stage in this selection process was to review the responses to consultation relative to the two options presented at statutory consultation. Responses received which are material to the choice of option are summarised in **Table 2A.6 Statutory consultation responses relevant to the Grid Connection/POC options** below. Comments received on the Grid Connection, including the Applicant's responses are provided within the **Consultation Report (Volume 5.1)** which accompanies the application.

Table 2A.6 Statutory consultation responses relevant to the Grid Connection/POC options

Response Topic	Response Summary
Local amenity	The connection to Walsoken looks the better option for local residents.
	The specific effects upon a specified property are significant and unacceptable.
	Concern about the effects upon people and animals as a result of the Grid Connection.
	Concerns over significant impacts to the local community and local villages.
	Concern over the noise generated by HDD to facilitate the Grid Connection. Also concern over noise created by OHL.
	Concerns about the effects upon local businesses and health and safety resulting from electro-magnetic effects.
Technology and routing	Concern about the additional pylons required to enable the Grid Connection.
	Request for more information in relation to the A47.

Response Topic	Response Summary
	Concern over the length of the Walpole connection in comparison to Walsoken, which might be able to use existing lines.
	Suggestion that the connection could run to the north/north west of the A47.
	Concern that neither Walsoken nor Walpole are suitable locations.
	Suggestions made that the EfW CHP Facility should be located closer to the Grid Connection to minimise its length.
	Requests that the connection be underground. Existing overhead lines are being actively removed.
Transport	Concern about the disruption caused on roads already congested.
	Suggestion to consider potential effects upon sensitive Receptors such as School Road, West Walton.
Landscape and visual	Concern about the appearance of the connection.
	Concern that the connection will cause additional negative visual effects across farmland and the countryside.
Other development	Concern that if Walpole is chosen, it will impact upon the existing solar farm.
	Proximity of National Grid assets in and around Walton Highway and Walpole,

5.2.2 Responses received at statutory consultation covered a range of issues associated with the Grid Connection Preferred Route Alignment options and POC options. Whilst some responses view the prospect of any connection unfavourably where preferences are made then they are towards achieving as short a connection as possible and one which would be underground rather than partially overhead.

5.3 The point of connection

Technical and cost considerations

5.3.1 The Applicant continued discussions with UKPN to ascertain the extent to which a connection from the EfW CHP Facility to the Walsoken DNO Substation would be constrained in its electrical output. Further work undertaken by UKPN confirmed that the estimated level of curtailment, restricting export of the maximum net electrical output from the CHP EfW Facility, would be 3.51% and mainly during the months of August, September and October each year.

5.3.2 The costs of the each UKPN connection offer were then compared for their ability to deliver the level of capacity required by the project together with the associated costs. The comparisons are set out in **Table 2A.7 UKPN comparative connection offers** below.

Table 2A.7 UKPN comparative connection offers

	Walpole DNO Substation	Walsoken DNO Substation
Maximum export capacity	62MW	62MW
Substation equipment	New extra high voltage plant and switchgear	New extra high voltage plant and switchgear
Connection voltage	132kV	132kV
Connection offer	£13.4m	£4.2m

5.3.3 Both of UKPN's connection offers assumed a wholly UCG connection.

Environmental considerations

5.3.4 In addition to consultation feedback, technical and cost comparisons the environmental implications of selecting either Walpole or Walsoken DNO Substations were assessed. For each, the assumption was that the Applicant would be required to obtain land outside of UKPNs operational substation in order to accommodate the equipment required to facilitate the connection. **Table 2A.8 UKPN substations, environmental conditions** summarises the baseline environmental conditions of each location.

Table 2A.8 UKPN substations, environmental conditions

	Walpole DNO Substation	Walsoken DNO Substation
Ecology	There are no designated ecological sites in proximity to the substation. The land surrounding is agricultural.	There are no designated ecological sites in proximity to the substation. The land surrounding is a mix of industrial and agricultural.
Landscape and visual	The site is well screened from French's Road but less so from Walpole Bank. It does not lie within a locally or nationally designated landscape.	The site is well screened from nearby residential properties. It does not lie within a locally or nationally designated landscape.

	Walpole DNO Substation	Walsoken DNO Substation
Traffic and Transport	The site lies some distance from the main trunk road network (A47) requiring vehicles to pass through Walpole St Andrew, Walpole St Peter, Walpole Marsh or West Walpole depending upon the direction of travel.	The site lies in close proximity to the A47. There is direct access from Broadend Road.
Historic environment	There are no listed buildings or historic areas within proximity to the site. It is not located within a historic landscape.	There are no listed buildings or historic areas within proximity to the site. It is not located within a historic landscape
Hydrology	The site is not in a flood zone. There are no waterbodies within or adjacent to the substation.	The site is not in a flood zone. There are no waterbodies within or adjacent to the substation.

5.3.5 Whilst both substations are located outside of an urban area, Walsoken is in closer proximity to the town of Wisbech than Walpole is to Walpole St Peter. Land uses which surround both DNO substations include residential with properties located along Walpole Bank and French's Road (Walpole) and along Broadend Road (Walsoken). The land surrounding the Walpole DNO Substation includes fields with planning permission for a solar farm whilst three overhead National Grid electricity lines cross into the site in addition to UKPN overhead lines. Similar UKPN overhead lines also run into the Walsoken DNO Substation, although less in number. Immediately to the west of the Walsoken site there are industrial properties. Walsoken benefits from easy access to the A47.

5.3.6 The Applicant concluded that both locations could satisfactorily accommodate the equipment necessary to achieve a POC (and both were taken forwards as options at statutory consultation). However, of the two it was considered that the Walsoken DNO Substation was a preferable location on environmental grounds subject to the form and location of the equipment proposed.

Conclusion on POC

5.3.7 Informed by the responses to statutory consultation and the costs of connection the Walsoken DNO Substation was chosen. Whilst the connection offer requires a level of curtailment to the net electrical output which the EfW CHP Facility can export, this estimated level of 3.51% is considered very minor by the Applicant and would not result in the export capacity reducing significantly. The environmental character of the location is not considered to be sensitive to the extent that the connection would give rise to significant effects although final conclusions on this matter are provided within the ES.

5.4 Location of Applicant's substation equipment

5.4.1 The Applicant is required to provide electrical equipment to transfer the electricity generated by the EfW CHP Facility into the existing UKPN equipment. Land is therefore required to accommodate the additional equipment and the Applicant looked at four locations adjacent to the Walsoken DNO Substation.

5.4.2 Four locations were identified either side of Broadend Road, two either side of 34-36 Broadend Road, one on UKPN's operational land and one in the adjoining field to the east. These are shown on **Figure 5.1: Alternative Options for the Walsoken Substation.**

5.4.3 Each location was reviewed for its environmental performance. Both sites south of Broadend Road can be categorised as being unmanaged grassland and scrub. The site adjacent 36 Broadend Road would require improvements to the exiting vehicle access, the site adjacent to 34 Broadend Road would require a new access. This may require the removal of some overgrown, mixed deciduous hedging. The equipment would be in relatively close proximity to the residential properties and require a cable trench to be placed under and across Broadend Road. Discussions with the landowner suggested a preference for the western of the two sites due to its intention to redevelop most of the land.

5.4.4 The land adjacent and to the east of the existing Walsoken DNO Substation forms part of an agricultural field. There is currently no vehicular access, and a new access would therefore need to be created which would cross a dry ditch. Use of this land for the siting of electrical equipment would extend the developed frontage of Broadend Road further to the east. The requirement to connect the site to the existing substation could result in the loss of a small section of boundary hedging.

5.4.5 The site identified within UKPN's landholding forms the existing frontage to the Walsoken DNO Substation. It includes an area of small trees and shrubs and existing electrical infrastructure. There is an existing access from Broadend Road alongside.

5.4.6 With the agreement of UKPN the Applicant selected the land, forming the present frontage to the Walsoken DNO Substation. This is because it is in the closest proximity to the POC and would be able to benefit from the existing UKPN access onto Broadend Road. Whilst some landscaping would be lost, the remainder would provide some screening of the equipment; and the concentration of all electrical infrastructure on essentially the same site would prevent the loss of greenfield land which might have otherwise occurred if a different option were chosen.

5.5 Substation equipment selection

5.5.1 The Applicant considered alternatives in relation to the substation equipment to be installed at its Walsoken Substation, located in front of the Walsoken DNO Substation (see above). Presently there are different switchgear technologies which can be used to control, protect and isolate electrical equipment. Traditionally these have been insulated using Sulphur Hexafluoride (SF6) which is an insulating and arc-suppressant gas. Draft NPS EN-5 Electrical Networks Infrastructure (September

2021) notes (paragraph 2.14.1) that SF6 is a potent greenhouse gas, and it goes on to state that its use in equipment should, as a rule, be avoided.

5.5.2 For this reason, the Applicant considered the use of alternative technologies these being air and clean air switchgear. Of the two options the clean air switchgear is favoured because it avoids the use of SF6 and is of a lower height (3.2m) when compared with the air insulated option which would be up to 6m tall. Whilst any infrastructure installed at the Walsoken Substation would be viewed in the context of the existing UKPN infrastructure, a lower structure is more easily screened by existing landscaping.

5.6 The Grid Connection route and technology choice

5.6.1 At statutory consultation the connection to the Walsoken DNO Substation was proposed to be a combination of an underground and overhead cable. The connection was to be underground along New Bridge Lane and through agricultural land before passing under Elm High Road where it would then cross the A47 before heading in a general northerly direction as an overhead line before reaching Broadend Road. At this point it would be underground in the highway and cross under the A47 to the proposed Walsoken Substation which would be adjacent to the Walsoken DNO Substation.

5.6.2 Informed by landowner discussions and statutory consultation responses the proposed route and technology choice was reviewed once the Walsoken DNO Substation had been chosen as the point of connection. A landowner intention to submit a planning application for residential development on land north of the A47, between Halfpenny Lane and Elm Low Road would have been sterilised in part potentially by the presence of the Applicant's proposed UCG. Consideration was therefore given to the placing of the cable in the A47 verge and discussions held with National Highways who agreed that this would be an option they could support.

5.6.3 With confirmation from National Highways that it did not have an in-principle objection to the placement of a cable within the verge of the A47, Alternative Route 2 to Walsoken (**Section 4.3** above) was reassessed. This was because the potential disturbance to landowners could now be avoided by placement of the cable in the verge. It was also considered important to reassess undergrounding in light of the comments received at statutory consultation.

5.6.4 An underground connection from the EfW CHP Facility to the Walsoken Substation utilising New Bridge Lane, the A47 verge and Broadend Road, representing a variation of the previously assessed Alternative Route 2 was considered and compared with the mixed UGC/OHL arrangement consulted upon at statutory consultation. This route is shown on **Figure 5.2: Grid Connection Route.**

Environmental and consultation response considerations

5.6.5 The principle of undergrounding the whole Grid Connection was reviewed with regard to the potential for environmental effects. Whilst there would be effects arising during construction as a result of the excavations necessary to place cables in ducts within trenches, these were considered to be no greater than those

assessed for the combined overhead and underground option considered at PEIR. Operational effects would, in principle be reduced.

5.6.6 The environment benefits of underground as opposed to overhead are that it would:

- Avoid any visual impact during operation (all infrastructure would be underground);
- Avoid any operational effects upon the landscape, including landscape elements such as trees and hedgerows;
- Remove any potential for the operation of the OHL to affect ecological Receptors, e.g., birds;
- Avoid any impacts on the agricultural activities on land over which the OHL would cross;
- Minimise ditch crossings and reduce the potential for pollution during construction;
- Remove the potential for effects on unrecorded archaeology (it is assumed that any unrecorded archaeology would have been disturbed during the construction of the A47); and
- Reduce the potential for EMF and noise potentially resulting from OHL.

5.6.7 In view of the above it was concluded that there is a clear environmental preference for a wholly underground connection. This would also be more consistent with the comments received at statutory consultation which are summarised in **Table 2A.6 Statutory consultation responses relevant to the Grid Connection/POC options** above.

Cost considerations

5.6.8 Undergrounding the whole of the Grid Connection would be more expensive than the combination of overhead and underground presented at statutory consultation with a wholly underground option being approximately six times as expensive. Based upon a cost assumption of £750 per linear metre (plm) underground cable and £125plmoverhead the following costs can be obtained:

- Underground and overhead connection to Walsoken DNO Substation as proposed at PEIR:
  - Length of underground cabling 3.13km@ £750plm = £2.347m;
  - Length of overhead 1.31km@ £125plm = £0.163m; and
  - Total = £2.51m (excludes substation costs).
- Underground connection to Walsoken DNO Substation:
  - Length of underground cabling 4.7km@ £750plm = £3.52m; and
  - Total = £3.52m (excludes substation costs).

5.6.9 The environmentally preferable option of underground would be more expensive than a combination of underground and overhead.

Conclusion on Grid Connection route and technology

5.6.10 The use of the A47 verge as the location for the Grid Connection avoids land proposed for future residential development and avoids disturbance to existing land uses. Consultation with National Highways, which has responsibility for the A47 and highway land either side has achieved agreement to the placing of the connection in this location, including the means by which it would be installed. It is concluded that use of the verge from a point east of New Bridge Lane to Broadend Road would be the most appropriate alignment for the connection.

5.6.11 There are clear environmental benefits arising from the undergrounding of the connection in comparison to overhead. These benefits are also recognised by consultees when responding to statutory consultation. It is concluded that an underground cable would be environmentally the most appropriate technology choice.

5.6.12 Undergrounding would be approximately £1m more expensive than the combination of overhead and underground presented at statutory consultation. However, given the reduction in the number of landowners affected by the proposed route and the improved environmental performance when compared to a partially overhead connection, the Applicant has concluded that the costs of the connection are outweighed by the benefits. On this basis a wholly underground connection along New Bridge Lane, the A47 verge and Broadend Road is selected, and it is this form of development which has been assessed and reported within the ES.

6. Conclusion

6.1.1 The Applicant is submitting a Development Consent Order application to the Secretary of State for the proposed Medworth Energy from Waste Combined Heat and Power Facility on the industrial estate, Algores Way, Wisbech Cambridgeshire. The Proposed Development will include a Grid Connection to export electricity to the national grid.

6.1.2 This report has been produced to explain how proposals for the Grid Connection have evolved from the earliest stage of corridor identification through to the identification of the preferred alignment and then through various iterations to the selection of a preferred and then final route. It explains the planning, environmental, technical, and cost factors taken into account when designing the Grid Connection.

6.1.3 This report forms part of a suite of documents which form the application submitted to the Secretary of State.

Figures

535000 540000 545000 550000 555000

320000 315000 310000 305000

Sutton Bridge
A17
Orange Row
Church Field
Emorsgate
South Green
Balsam Field
Walpole Gross Keys
Tydd St Mary
Holbeach St Johns
Sutton St James
Tydd Gote
Foul Anchor
Walpole Marsh
Walpole St Andrew
Walpole St Peter
Tilney All Saints
Tilney High End
A47
Tydd St Giles
Four Gotes
Ingleborough
Newton-in-the-Isle
Terrington St John
Walpole Highway
Sutton St Edmund
West Walton
Walton Highway
Tilney St Lawrence
Fitton End
Gorefield
Leverington
St John's Fen End
Tilney Fen End
A1101
Walsoken
Wisbech
Marshland St James
Throckenholt
Church End
Parson Drove
Great Boleness
Wisbech St Mary
Paradise
Field
Emneth
Emneth Hungate
Marshland Fen
Bunker's Hill
Murrow
Elm
Tholomas Drove
Begdale
Holly End
West Head
Boyces Bridge
The Fens
Friday Bridge
Waldersey
Outwell
Stow Bardolph Fen
Guyhirn
Ring's End
Coldham
Upwell

Key

- EfW CHP Facility Site
- Walsoken Substation
- Walpole Substation
- Study Area
- Existing 400kV OHL
- Common route
- 132kV East (Most direct route)
- 132kV West (Most direct route)
- 400kV West (Most direct route)

0 1,000 2,000 3,000 4,000 m

Scale at A3: 1:75,000

Client

Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report

Figure 2.1
Potential Points of Connection

June 2022

wood.

41310-Shr335

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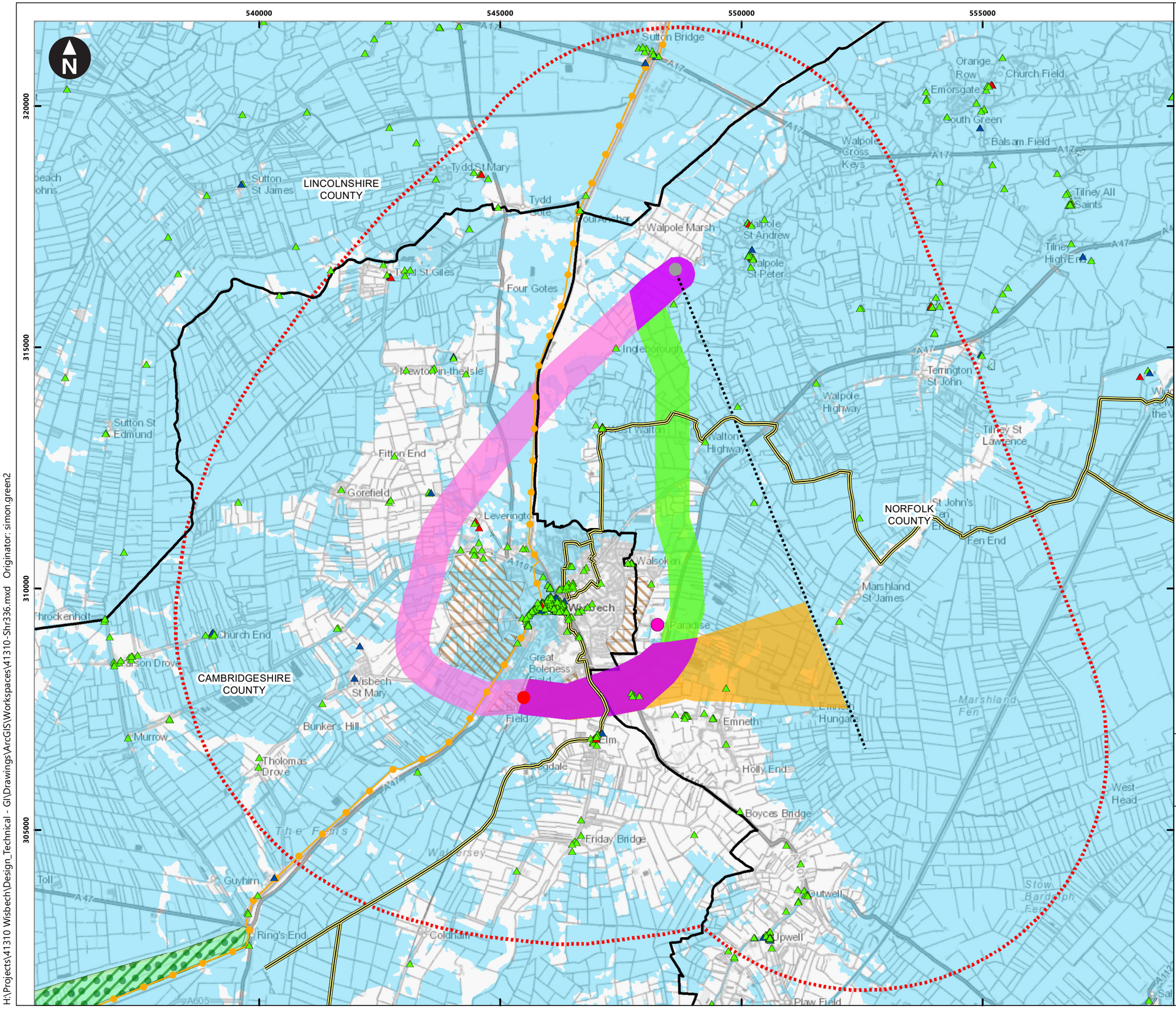

Client

Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report

Figure 2.2
Constraints Plan

June 2022

wood.

41310-Shr336

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542000 544000 546000 548000 550000 552000 554000

316000 314000 312000 310000 308000 306000

Four Gotes
Newton-in-the-Isle
Fitton End
Gorefield
Wisbech St Mary
Bunkers Hill
Leverington
Walpole Marsh
Walpole St Andrew
Walpole St Peter
Ingle Trough
West Walton
Walton Highway
Walpole Highway
Terrington St John
St John's Fen End
Marshland St James
Paradise
Great Boleness Field
South Bridge Field
Begdale
Holly End
Emneth Hungate
Emneth Gaultree
A47
A1101
B1169
B1542
B198
B1359

Key

132 kV draft corridor

Greenspaces

- Allotments Or Community Growing Spaces
- Sports Facilities
- Cemetery / Religious Grounds
- Play Space / Field
- Public Park Or Garden

Grade

- Listed Building - Grade I
- Listed Building - Grade II
- Listed Building - Grade II*
- Authorised Landfill
- Historic Landfill
- Schedule Ancient Monument
- Ancient Woodland

Priority Habitats

- Coastal and floodplain grazing marsh
- Deciduous woodland
- Lowland calcareous grassland
- Lowland fens
- Mudflats
- Traditional orchard

0 500 1,000 1,500 2,000 2,500 m

Scale at A3: 1:45,000

Client

Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report

Figure 4.1
132kV Grid Connection East, Constraints Map

June 2022

wood.

41310-Shr337

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542000
544000
546000
548000
550000
552000
316000
314000
312000
310000
308000
Tydd St Giles
Four Gotes
Newton-in-the-Isle
Fitton End
Gorefield
Leverington
Wisbech
Wisbech St Mary
Hill
Walpole Marsh
Walpole St Andrew
Walpole St Peter
Ingleborough
West Walton
Walton Highway
Walsoken
Wisbech
Paradise
Great Boleness Field
South Bridge Field
Elm
Emneth Gaultree
Emneth Hungate
Walpole Highway
Marshland St James
A47
A1101
B1169
B1542
B198
Key
Temporary Construction Compounds
Grid Connection Route Alignment Options
OHL 1
OHL 2
UGC
0
500
1,000
1,500
2,000 m
Scale at A3: 1:40,000

Client
Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report
Figure 4.2
132kV Grid Connection East Alternative Routes
June 2022
wood.
41310-Shr338
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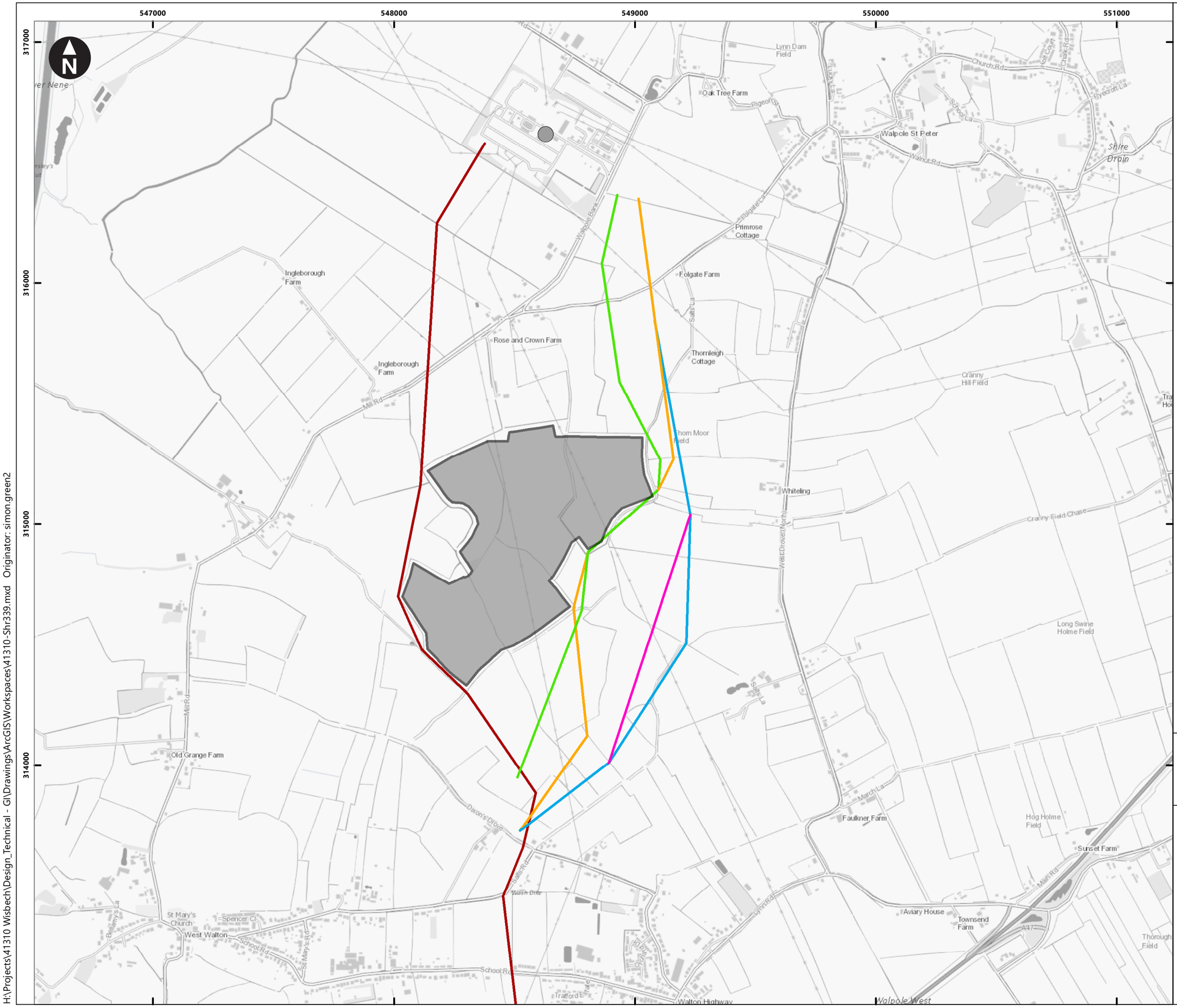

Key

- Walpole Substation
- Rose Hill Solar Farm
- OHL 2

Grid Connection Northern Alignment Options

- Route 1
- Route 2
- Route 3
- Route 4

0 200 400 600 800 m

Scale at A3: 1:15,000

Client

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Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report

Figure 4.3
132kV Grid Connection Northern Alignment Options avoiding the Solar Farm

June 2022

wood.

41310-Shr339

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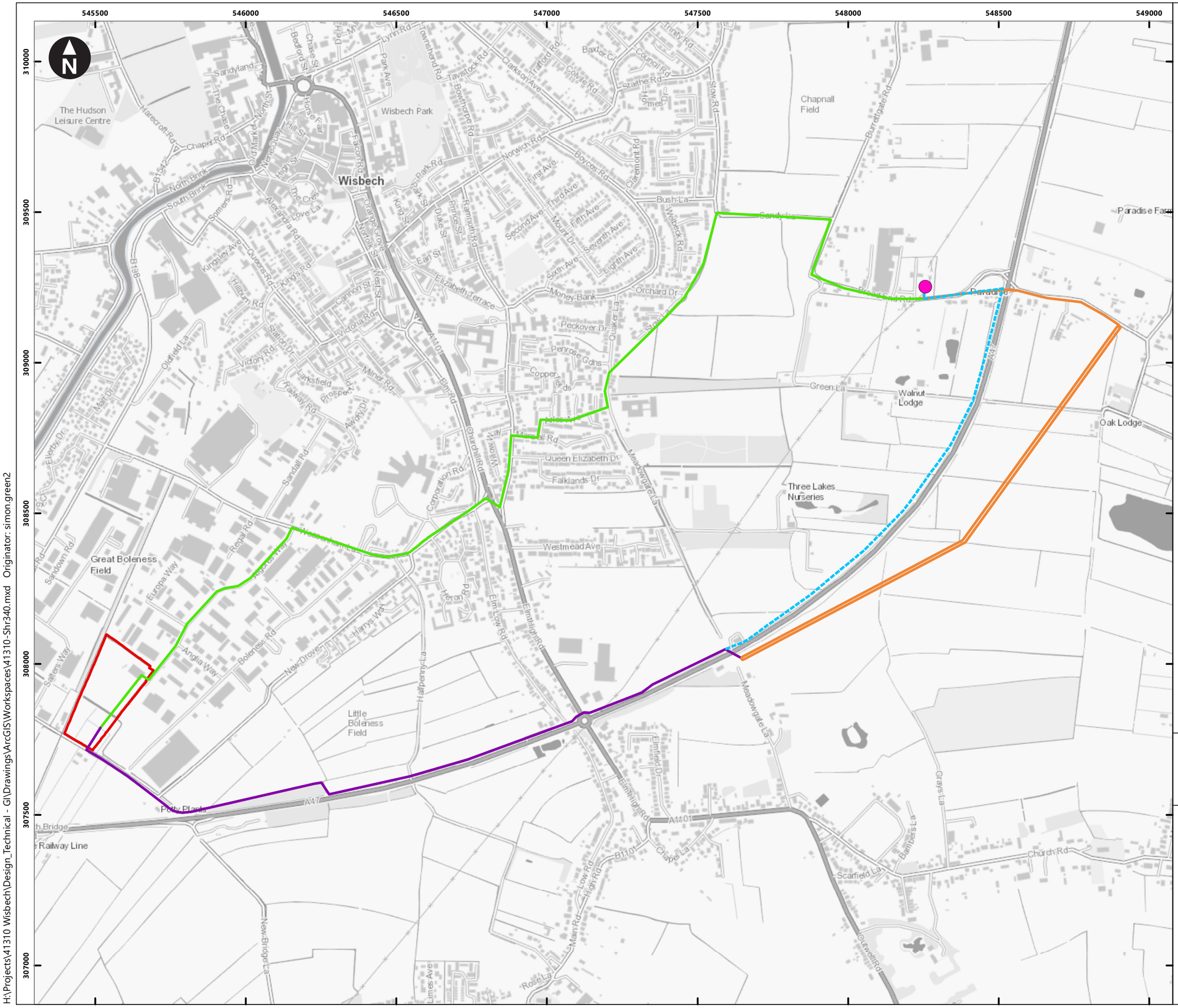

Client

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Appendix 2A Grid Connection Options Report

Figure 4.4
Walsoken Alternative Grid Connection Options

June 2022

wood.

41310-Shr340

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547000
548000
549000
310000
309000
308000
N
Walsoken
Church Rd
Chapnall Rd
Fundrey Rd
Burrett Rd
Sparrowgate Rd
Sleights Dr
Kirkgate St
Lerowe Rd
Fernland Rd
Lemmen Pl
Sefton Ave
Trinity Rd
Baxter Cl
Council Rd
Clarkson Ave
Trafford Cl
Colville Rd
Slow Rd
Chapnall Field
Norwich Rd
First Ave
Boyces Rd
Claremont Rd
Bush La
Wellbeck Rd
Second Ave
Third Ave
Fifth Ave
Seventh Ave
Mount Dr
Sixth Ave
Eighth Ave
Money Bank
Orchard Dr
Peckover Dr
Quaker La
Penrose Gdns
Copper Beeches
Aries Ave
Mansell Rd
Queen Elizabeth Dr
Falklands Dr
Three Lakes Nurseries
Westmead Ave
Elm High Rd
Broad End Rd
Paradise
Green La
Walnut Lodge
A47
Stratton
The Bungalow
Bloors Rd
Paradise Farm
Sibley Field
Wilkins Rd
Salamar House
Leman's Knapemoor Field
Fendike Crofts
Cadys Drove
Key
Walsoken Substation
Administrative boundaries
Strategic Allocations
National Cycle Network
Allotments Or Community Growing Spaces
Cemetery / Religious Grounds
Play Space / Field
Historic Landfill
Schedule Ancient Monument
Deciduous woodland
Traditional orchard
Scheduled Monuments
Listed Building - Grade I
Listed Building - Grade II
Flood Zone 3
0 100 200 300 400 500 600 m
Scale at A3: 1:10,000

Client
Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report
Figure 4.5
Walsoken Constraints Plan
June 2022
wood.
41310-Shr341
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548000

549000

550000

317000

316000

N

The Marsh

Marsh Rd

Walpole Marsh

Frenchs Rd

East Croft Field

Walpole St Andrew

Candlestick Cottage

Westbech Rd

Police Rd

Springfield Rd

Lynn Dam Field

Lucky La

Oak Tree Farm

Pigeon St

Walpole Bank

Folgate La

Primrose Cottage

Folgate Farm

Salts La

Thornleigh Cottage

Rose and Crown Farm

Ingleborough Farm

Ingleborough Farm

Mill Rd

Thorn Moor Field

Key

- Walpole Substation
- Existing 400kV OHL
- Administrative boundaries
- Cemetery / Religious Grounds
- Play Space / Field
- Deciduous woodland
- Traditional orchard
- Listed Building - Grade I
- Listed Building - Grade II
- Flood Zone 3

0 100 200 300 400 500 600 m

Scale at A3: 1:10,000

Client

Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report

Figure 4.6
Walpole Constraints Plan

June 2022

wood.

41310-Shr342

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547500
548000
548500
549000
309500
309000
N
1
2
3
4
Key
Walsoken substation location options
0
100
200
300 m
Scale at A3: 1:5,000

Client
Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report
Figure 5.1
Alternative Location Options for the Walsoken Substation
June 2022
wood.
41310-Shr389
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546000
547000
548000
309000
308000
N
Wisbech
Great Boleness Field
Little Boleness Field
Poty Plants
Three Lakes Nurseries
Walnut Lodge
Paradise
A1101
A47
B1101
B198
B1542
Key
EfW CHP Facility Site
Walsoken Substation
Cable route
0 100 200 300 400 500 600 m
Scale at A3: 1:10,000

Client
Medworth CHP Limited
Medworth Energy from Waste Combined Heat and Power Facility DCO
Environmental Statement
Appendix 2A Grid Connection Options Report
Figure 5.2
Grid Connection Route
June 2022
wood.
41310-Shr343
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