

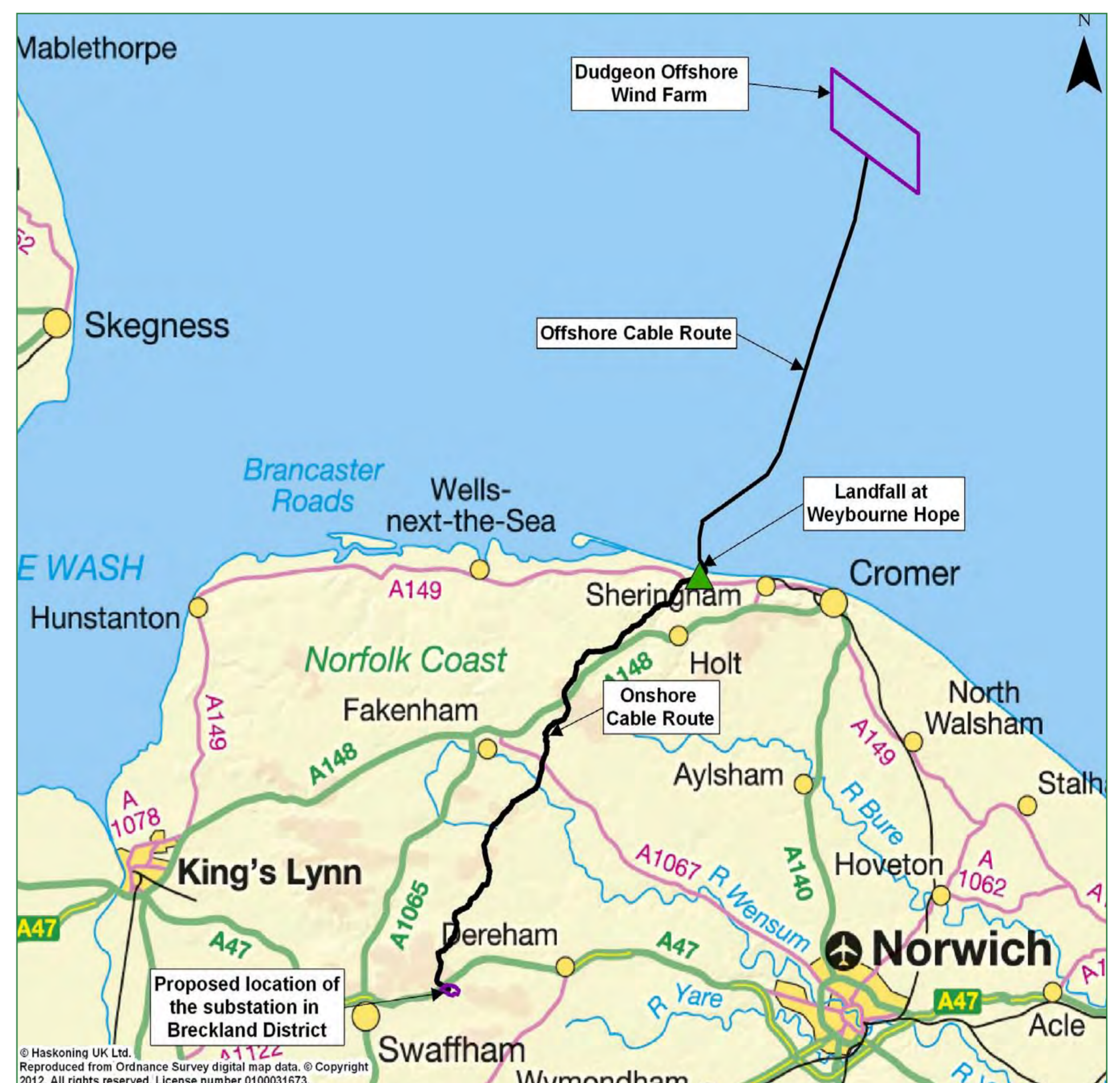
DUDGEON OFFSHORE WIND FARM

Necton Substation and Cable Route Spur

PROJECT DESCRIPTION

Dudgeon Offshore Wind Farm (Dudgeon)

- Dudgeon is one of a number of offshore wind farms planned in the Greater Wash area
- The offshore wind farm would be located over 32km to the north of Cromer and cover an area of 35km²
- Subsea cables would bring the electricity ashore at Weybourne Hope, on the north Norfolk coastline
- Up to 168 wind turbines are planned, generating up to 560MW of renewable electricity
- Once operational, the project would supply enough electricity to power up to 400,000 homes each year, equivalent to every household in Norfolk
- If all consents are received this year, Dudgeon could be operational in 2015



The offshore wind farm location and onshore works

Onshore electrical connection



The coastline at Weybourne Hope

- Dudgeon requires an onshore electrical connection in order to feed the power generated by the offshore wind farm into the national electricity transmission system
- The onshore works would comprise a new electrical substation in Breckland district and a buried cable system, running for approx 46km from the landfall at Weybourne Hope, in North Norfolk district, to the new substation
- If planning permission is received this year, the substation construction and cable installation would start in 2013 and take approximately two years to complete

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BACKGROUND

Who is Dudgeon Offshore Wind Limited?

- Dudgeon Offshore Wind Limited (DOW) is a subsidiary of Warwick Energy Limited (Warwick) and was formed to develop the Dudgeon project
- Warwick's previous experience of developing such projects includes the 30 turbine offshore project at Barrow, off the Cumbrian coast, and the 100 turbine offshore project at Thanet, off the east coast of Kent

UK Government's renewable energy targets

- The UK Government's energy strategy includes a target to generate 20% of the UK's electricity needs from renewable sources by 2020; the UK currently generates less than 10% of its electricity from renewable sources
- The development of offshore wind farms is key to meeting the UK Government's renewable energy obligations and will contribute to the security of the UK's energy supplies

Why are the onshore works located in Norfolk?

- The UK Government identified the Greater Wash as a strategic area for the development of offshore wind farms; Dudgeon is one of several projects proposed in the area
- The north Norfolk coastline is the nearest land to the Dudgeon site; selecting north Norfolk for the cable landfall point therefore has the advantage of minimising energy losses, cable costs and disturbance to the seabed
- Early consultation with key stakeholders such as National Grid indicated that a project of Dudgeon's size would need to connect to the 400kV electrical network that runs between Norwich and King's Lynn

How will the application be processed?

- DOW must obtain planning permission for the Necton substation and cable route spur from Breckland Council
- DOW is undertaking an Environmental Impact Assessment (EIA) for the Necton substation and cable route spur
- The decision as to whether planning permission for the Necton substation and cable route spur is awarded will depend on the findings of the EIA which will be summarised in an Environmental Statement submitted with the planning application

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WHY ARE THERE PLANS FOR A SUBSTATION AT NECTON?

2009

- A consent application for the Dudgeon offshore works was submitted to the Department of Energy and Climate Change (DECC) in June 2009, and a decision is expected shortly
- Following an extensive review of over 100 potential substation sites an application was made to Breckland Council for planning permission to construct and operate a substation near Little Dunham, as well as a section of buried cable system between the boundary with North Norfolk district and the substation site

2010

- The section of buried cable system received planning consent from Breckland Council in October 2010, subject to a number of conditions
- Permission for the substation at Little Dunham was refused based on how the substation might affect the landscape at that location, mainly due to its relative proximity to the village of Little Dunham
- The decision by Breckland Council was appealed to the Planning Inspectorate

2011

- A public hearing was held in June 2011 which resulted in the appeal being refused by the Secretaries of State for Energy and Climate Change and for Communities and Local Government who had recovered the appeal from the Planning Inspectorate
- This refusal was appealed to the High Court

What's happening now?

- The Little Dunham appeal to the High Court was successful and the Secretaries of State now have to reconsider their decision; Little Dunham remains the preferred site for the substation
- In parallel with the Little Dunham appeal, and in order to ensure timely progress of the Dudgeon project, the next most suitable site for the substation was identified as being located near to the A47, between the villages of Necton and Little Fransham
- Alternative proposals are therefore being progressed for the Necton substation location and the associated cable route spur, required to connect the Necton substation with the rest of the cable route that has already been granted planning permission by Breckland Council

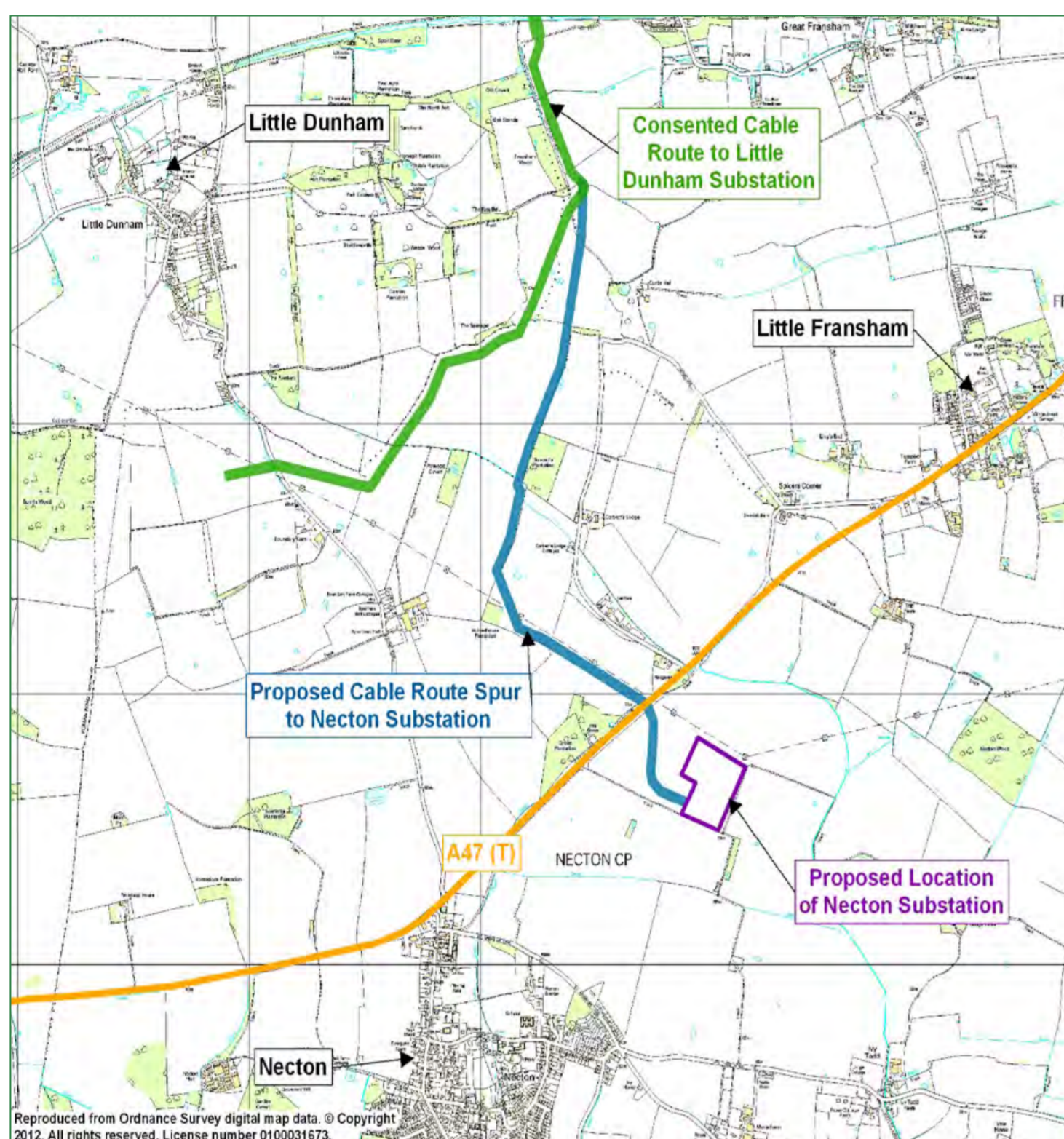
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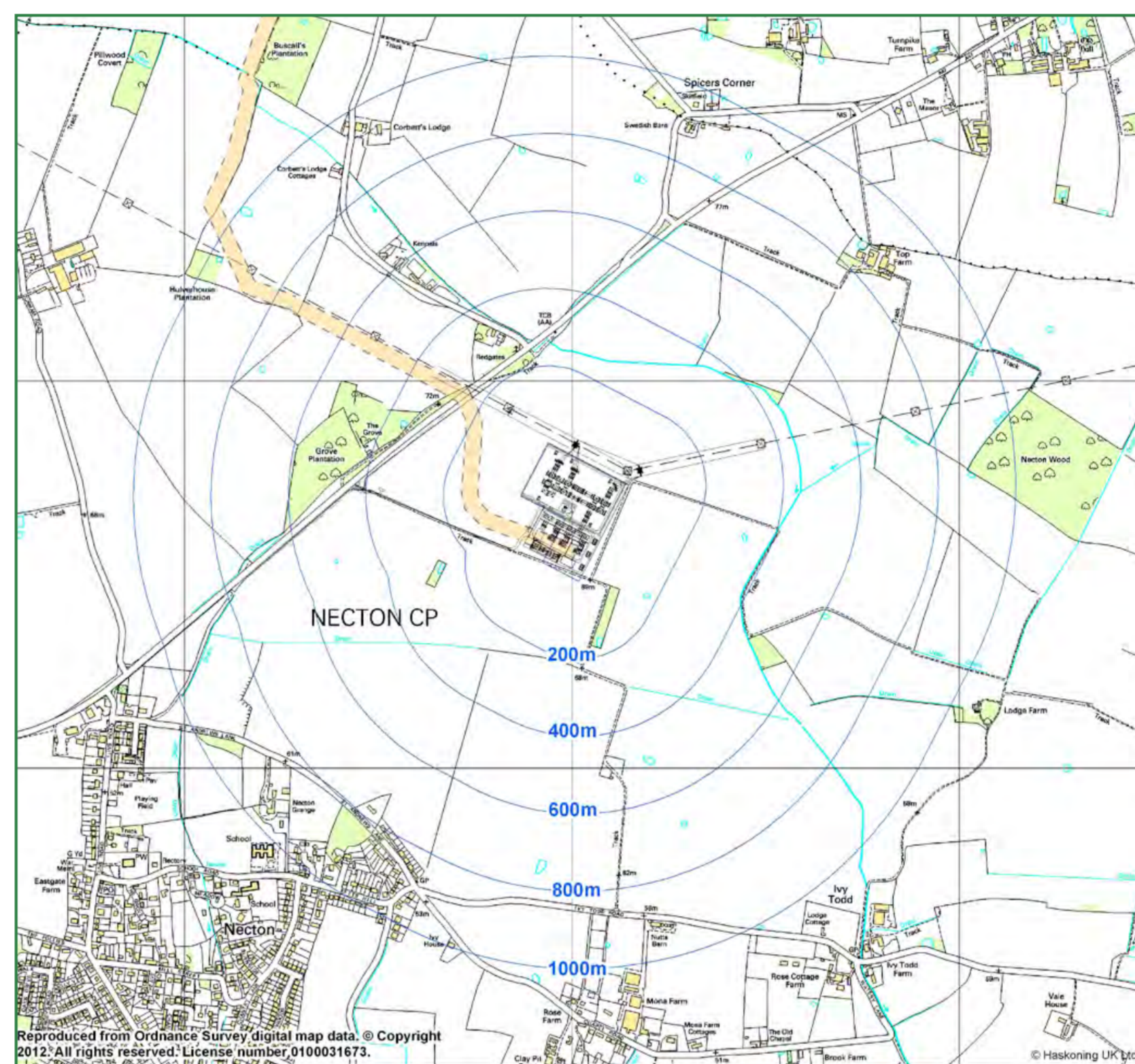
NECTON PROPOSALS

Proposed Necton Substation and Cable Route Spur

The Necton substation and associated cable route spur are an important part of the overall project, required to connect the Dudgeon Offshore Wind Farm to the national electricity transmission system



Location of the Necton substation and cable route spur



Distance contours from the Necton substation boundary

The location of the Necton substation is approximately 760m from the outskirts of Necton and 1,230m from the outskirts of Little Fransham; no house is within 280m (850 feet) of any of the new equipment proposed at the substation

Key details of the Necton substation

- The site would be located adjacent to the existing overhead lines – no new overhead lines are proposed
- A single tower would be replaced with two new towers to allow the overhead lines to be connected to the new substation
- Screening would be provided to conceal the substation from local views, as far as possible; this would be done through landscaping, for example by creating new areas of native woodland
- The overall footprint of the substation is likely to be around 15 acres, excluding landscaping mitigation measures, which is similar in size to other substations carrying out similar tasks
- The tallest structures in the substation are expected to be 15m high, but most structures would be less than 10m high
- No construction traffic would pass through Necton, with an existing farm track being improved to achieve site access from the A47 during construction
- Under normal operation the substation would be unmanned and would normally be unlit at night
- The noise generated by the substation is being assessed against the existing background noise levels and would be subject to stringent consent conditions from Breckland Council to avoid disturbance

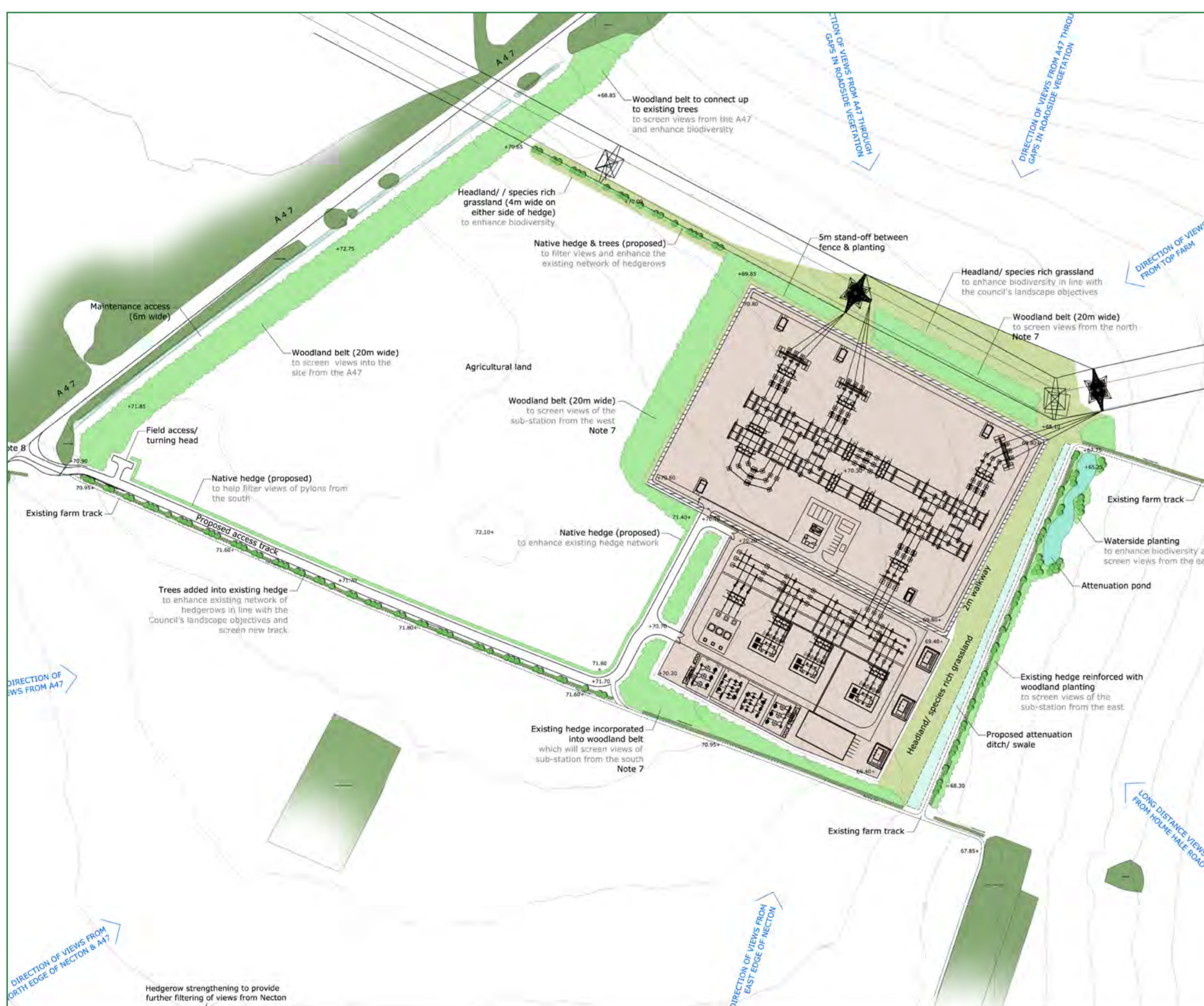
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ELECTRICAL SUBSTATION

The substation would have two main parts, both of which would be included in any planning application and are shown in the draft layout below

- National Grid would build and operate a 400kV section of the substation adjacent to the existing overhead lines together with the necessary line modifications
- DOW would build and operate a section of the substation adjacent to the National Grid substation, which would contain the remaining equipment necessary to connect to the National Grid substation



Draft substation layout showing the mitigation proposals

Although the design of the new substation is still being developed, it will look similar to an existing modern substation



Key improvements from the Little Dunham proposals

- The design of the substation has been modified and improved since the proposals submitted for Little Dunham in 2009; this means that the potential visual impact of the substation would be greatly reduced wherever it is located
- The option of using DC electricity has been dropped, removing the need for large converter buildings
- The layout of the substation has been improved, removing the long runs of cable gantries

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WHAT WILL THE SUBSTATION LOOK LIKE?

Wireframes of the proposed substation have been created for several key viewpoints, which have been selected to represent:

- Views from public places
- Views of nearest residents
- Views from key recreational areas/paths

Viewpoint 07

Representative photomontage of the view from the A47 near Top Farm

Baseline photograph



Wireframe photomontage (no mitigation included)



Viewpoint 03

Representative photomontage of the view from the bus stop near the Dunham Road junction

Baseline photograph



Wireframe photomontage (no mitigation included)



Viewpoint 10

Representative photomontage of the view from the eastern edge of Necton at St Andrews Lane

Baseline photograph



Wireframe photomontage (no mitigation included)



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ENVIRONMENTAL IMPACT ASSESSMENT

An Environmental Impact Assessment is being undertaken for the Necton substation and associated cable route spur, assessing the potential impacts of the development on:

- Nature conservation and ecology
- Archaeology and cultural heritage
- Landscape and visual impact
- Geology, hydrogeology, hydrology and land quality
- Traffic and access
- Noise and vibration
- Dust and air quality
- Local community, land use, recreation and tourism

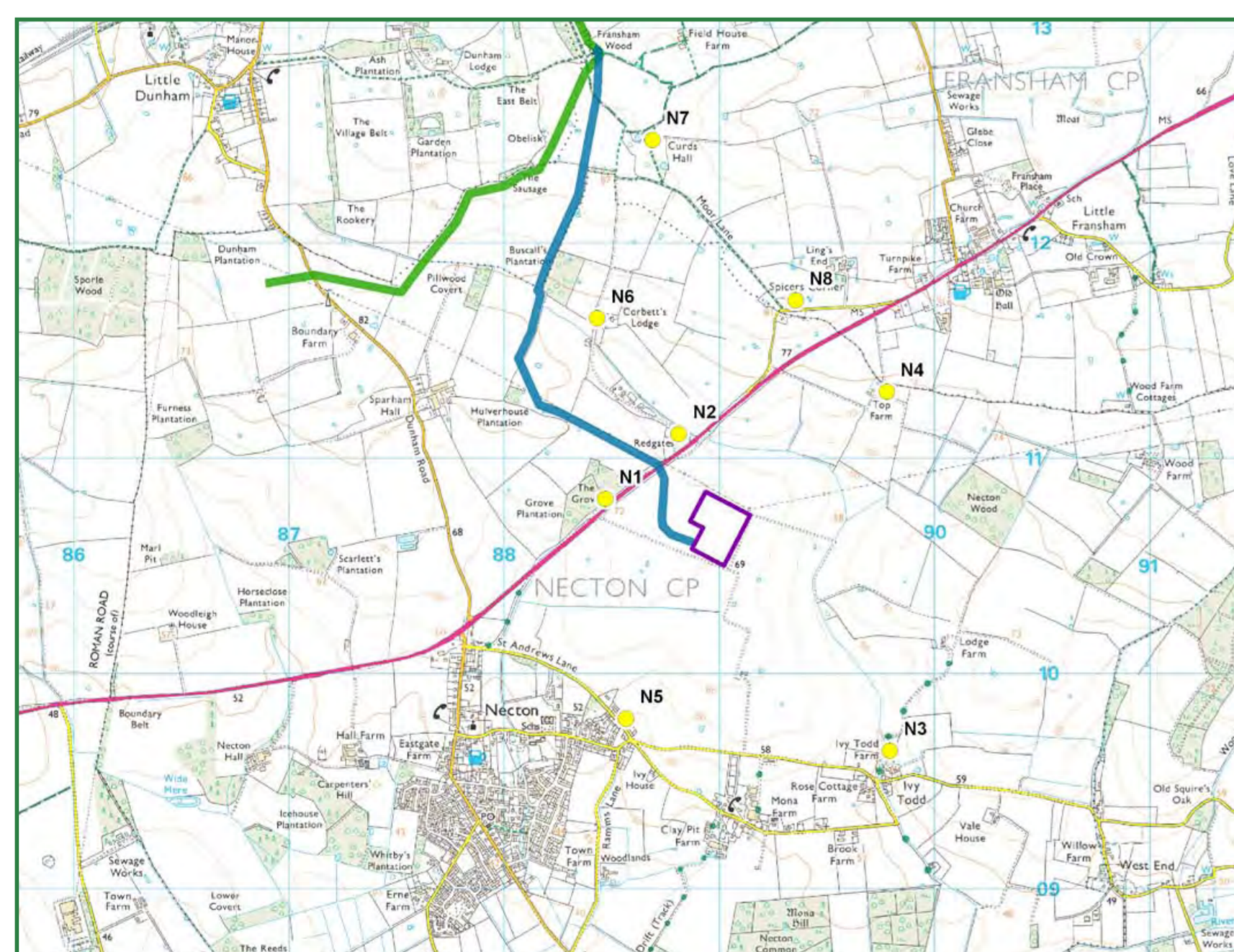
Baseline surveys

Traffic and access

A Transport Assessment is being developed with the Highway Authorities; an existing farm access off the A47 would be used to access the site during construction to ensure that no construction traffic passes through Necton

Noise Surveys

Noise surveys were carried out at eight locations around the substation site, which were agreed in consultation with Breckland Council



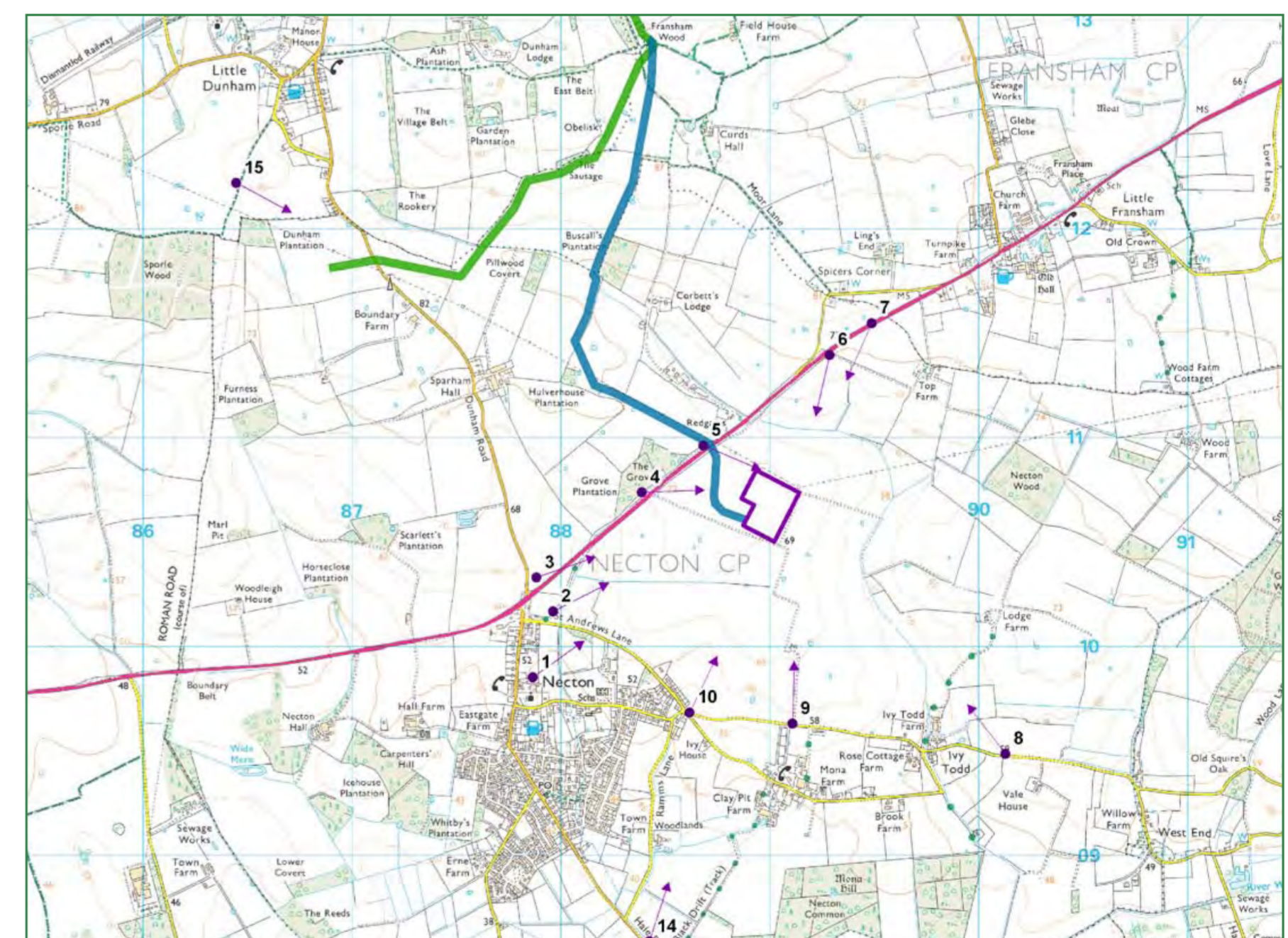
Noise survey locations

Ecological surveys

An extended habitat survey of the cable route corridor has been carried out; all habitats and plant communities within the study area have been recorded and mapped

Landscape and visual assessments

Landscape and visual assessments are being undertaken at fifteen selected viewpoints around the substation site, which were agreed in consultation with Breckland Council



Necton substation viewpoint locations

Consultation

Consultation is being carried out with the local planning and environmental bodies throughout the EIA process. The organisations consulted include, but are not limited to: Breckland Council, Norfolk County Council, The Environment Agency, Natural England, The Highway Authorities, English Heritage, National Trust, RSPB, Norfolk Wildlife Trust and The Historic Environment Service; ***we are also very interested to hear your views***

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BENEFITS

- The capital cost of the Dudgeon development would be approx £1.5bn; a proportion of this would be spent locally providing a boost to local businesses over the two year construction period including the use of local hotels, restaurants, and other facilities
- Local firms would have the opportunity to act as subcontractors for various aspects of the onshore construction work and to supply the construction materials needed
- Longer term, there would be job opportunities at the planned coastal offshore operation and maintenance base, with at least 50 full time jobs being created
- The project would make a significant contribution towards the UK's renewable energy targets to help tackle climate change
- The project would also make a positive contribution to the UK's security of electricity supplies

NEXT STEPS

- It is currently anticipated that the planning application for the Necton substation and cable route spur will be submitted to Breckland Council in June 2012
- An Environmental Statement for the Necton substation and cable route spur will accompany any planning application
- Following the submission of the planning application, Breckland Council will hold their own formal public consultation, during which time members of the public will be able to comment on the detailed proposals
- The planning application and Environmental Statement will be made available at local libraries and at the district council offices; a copy will also be provided to the local parish councils

FIND OUT MORE AND CONTACT US

- Freephone - 0800 0352874
- Freepost - Dudgeon Offshore Wind Farm Substation Consultation, Peterborough, PE1 1JL
- Email - consultation@dudgeonoffshorewindfarm.co.uk
- Website - www.dudgeonoffshorewindfarmconsultation.co.uk

We would like to take account of any comments you may have as we finalise our planning application and would be grateful if you could take the time to complete a short questionnaire giving us your comments on the proposed Necton substation and cable route spur

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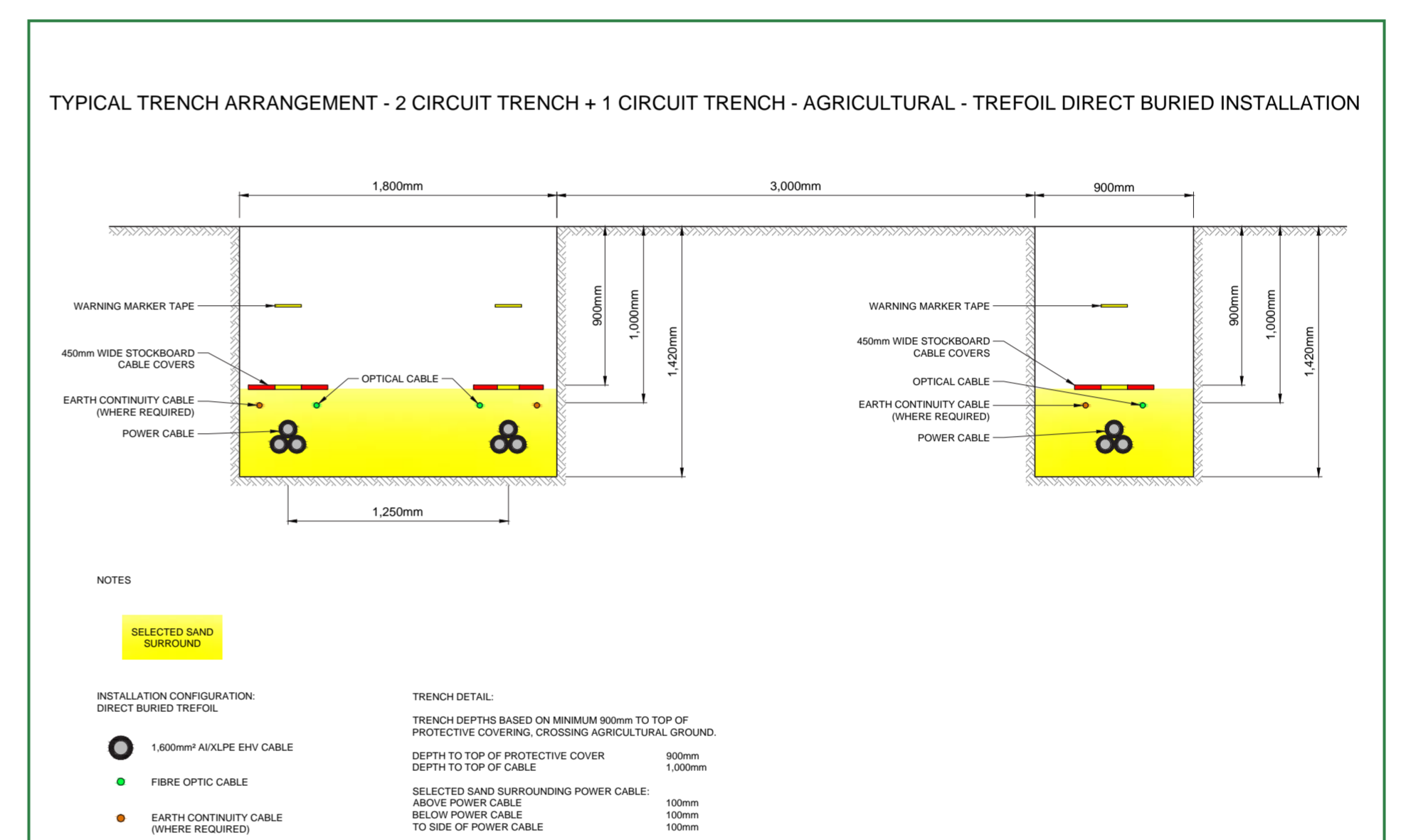
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CABLE ROUTE SPUR

Cable Route

Alongside the proposed Necton substation, a 3km section of buried cable system (cable route spur) is also required to connect the substation with the previously consented section of buried cable system

- Up to three cable circuits in up to two trenches would be used in parallel along the 3km cable length
- Cables would be buried to a minimum depth of 1m along the route; no new overhead lines are proposed
- The installed cable corridor would be up to 10.5m wide
- Cables may be installed in plastic ducts or laid directly into the ground
- Each circuit would be arranged in sections of typically 600 - 700m in length; a process of cable jointing is required at the connection point between cable sections
- Once complete, the ground above the jointing bays and the cable system would be fully reinstated



Typical cable trench arrangement

Cross Bonding Pits / Pillars

- At each jointing bay, a process of 'cross bonding' would be required in order to earth the cables
- Cross bonding pits or pillars need to be located within 10m of a cable joint and require permanent access
- The cross bonding pits or pillars would be the only permanent above ground features of the cable route
- Wherever possible the cross bonding pits or pillars would be located at field boundaries



Cross bonding pit and pillar



Horizontal Directional Drills

- At the A47 road crossing, Horizontal Directional Drilling (HDD) would be used to install the cable ducts
- HDD allows the cables to be installed under the road without any disturbance to road users