

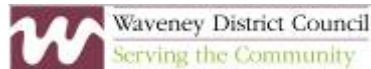
# Offshore Wind

## The Germany / UK Connection



5<sup>th</sup> October 2006 – Astral Centre, Lowestoft College

Sponsored by:



[www.offshore-power.net](http://www.offshore-power.net)



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# Greater Gabbard Offshore Wind Farm

## *Project Status*

*Chris Hill Airtricity  
UK Offshore Development Manager*

*4<sup>th</sup> October 2006*



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## Agenda

- The SPV & Greater Gabbard Offshore Wind Farm
- Project Status & Timeline
- Windfarm Layout
- Foundation Design
- Export Cable Route
- Onshore Works
- O&M

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## Greater Gabbard Offshore Winds Limited

- A special purpose company owned equally by Fluor International Limited and Airtricity Holdings Limited

**Airtricity**  
The Annual Progression

*A world leading integrated  
renewable energy company*

**Greater  
Gabbard Offshore  
Wind Ltd.**

**FLUOR**

*A world class  
EPC Contractor*

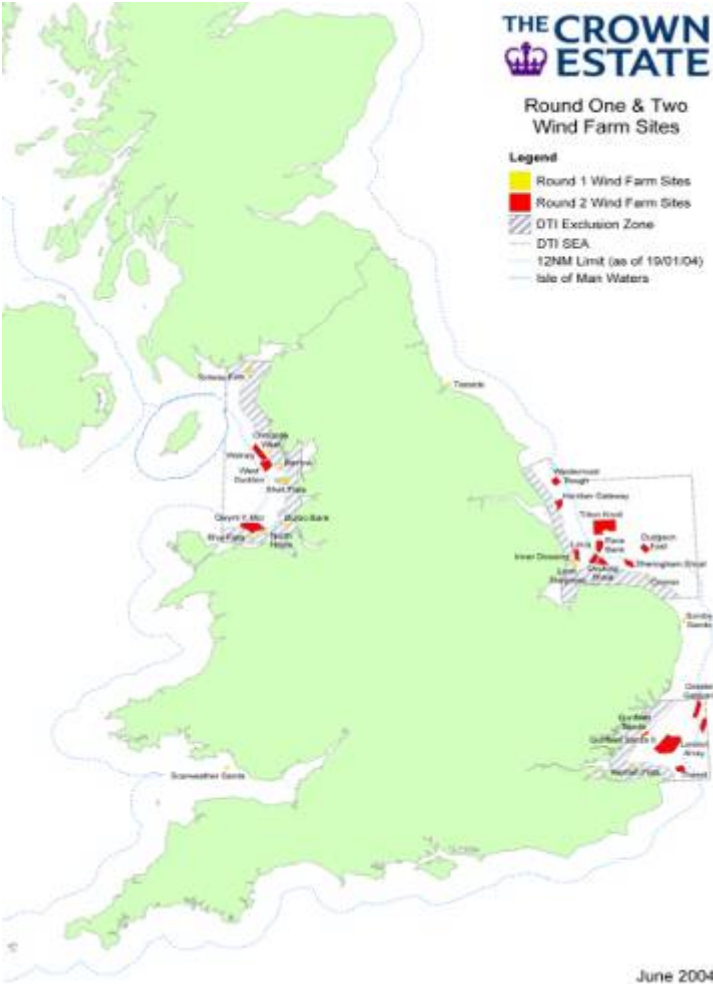
 Greater Gabbard  
Offshore Winds Ltd



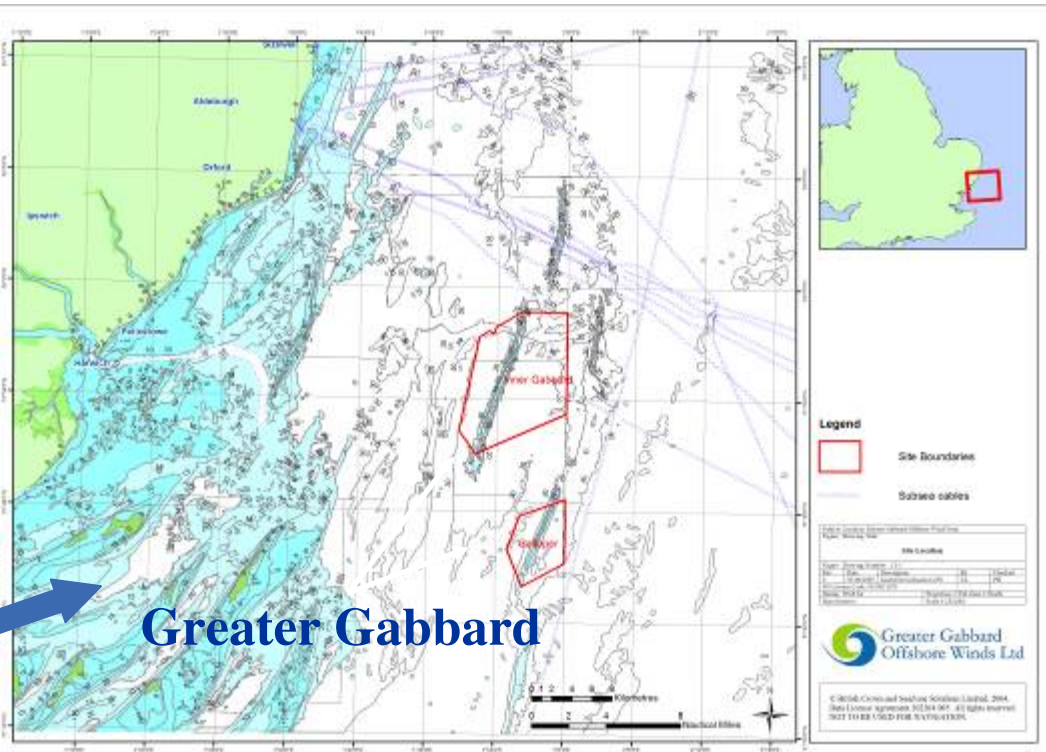


# Greater Gabbard Offshore Windfarm Location

## The Outer Thames Estuary



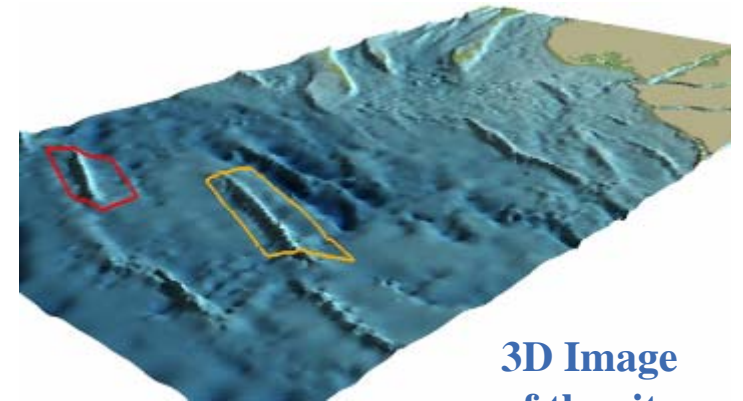
Greater Gabbard





## Greater Gabbard Offshore Windfarm Project

- **Turbines:** Hub height of up to 105m, rotor diameter of up to 130m and spaced between 650 to 1100m apart
- **Capacity:** 500MW, sufficient generation to supply equivalent of 415,000 homes – more than the domestic demand of Suffolk
- **Electricity Output:** 1.8 TWh/yr
- **Site Area:** approximately 147 km<sup>2</sup>
- **Site Features:**
  - High Wind Speed
  - No Known Environmental Sensitivities
  - Suitable Water Depth
  - Suitable Ground Conditions
  - Good Nearby Ports for Construction and O&M



**3D Image  
of the site**



## Project Status

- Consent application submitted October 2005
  - No known environmental sensitivities
  - Second UK Round 2 project to submit
- Detailed offshore site investigation completed summer 2006
- EPC Contractor Appointed
- Advisors appointed
  - Financial Advisors: Royal Bank of Canada
  - Legal Advisors: LinkLaters
  - Insurance: Marsh
- Negotiating with wind turbine suppliers
- Procurement 4Q06 to 1Q07

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## Greater Gabbard Offshore Wind Farm –Timeline

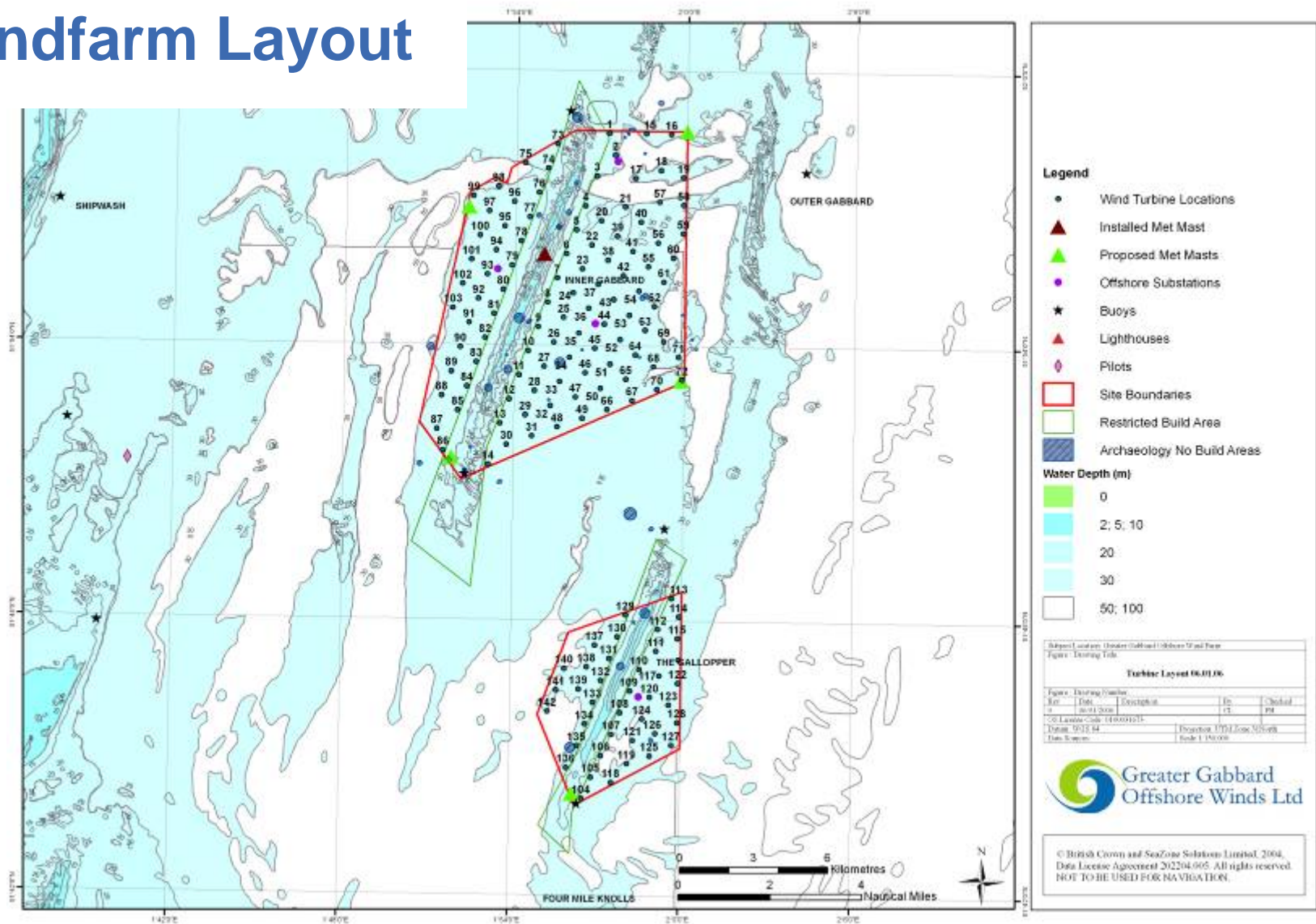
Activity	Target	Completed
Site award	Q4 2003	Q4 2003
Site investigations	Q2-4 2004	Q2-Q4 2004
Install met mast	Q3 2005	Q3 2005
Submit consents application	Q4 2005	Q4 2005
Issue turbine Prequal	Q3 2005	Q3 2005
Issue turbine ITT	Q2 2006	Q2 2006
Detailed geotech investigation	Q2 2006	Q2-3 2006
Receive consents	Q4 2006	
Financial Close	Q3 2007	
Construction of 1st phase	2009	
Construction of 2nd phase	2010	





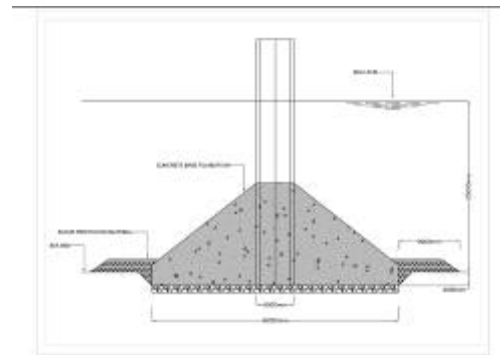
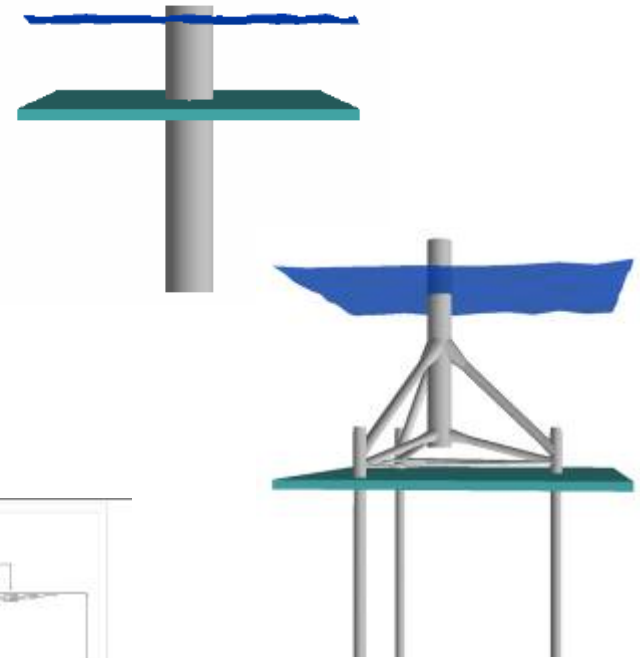
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## Windfarm Layout



## Foundation Design

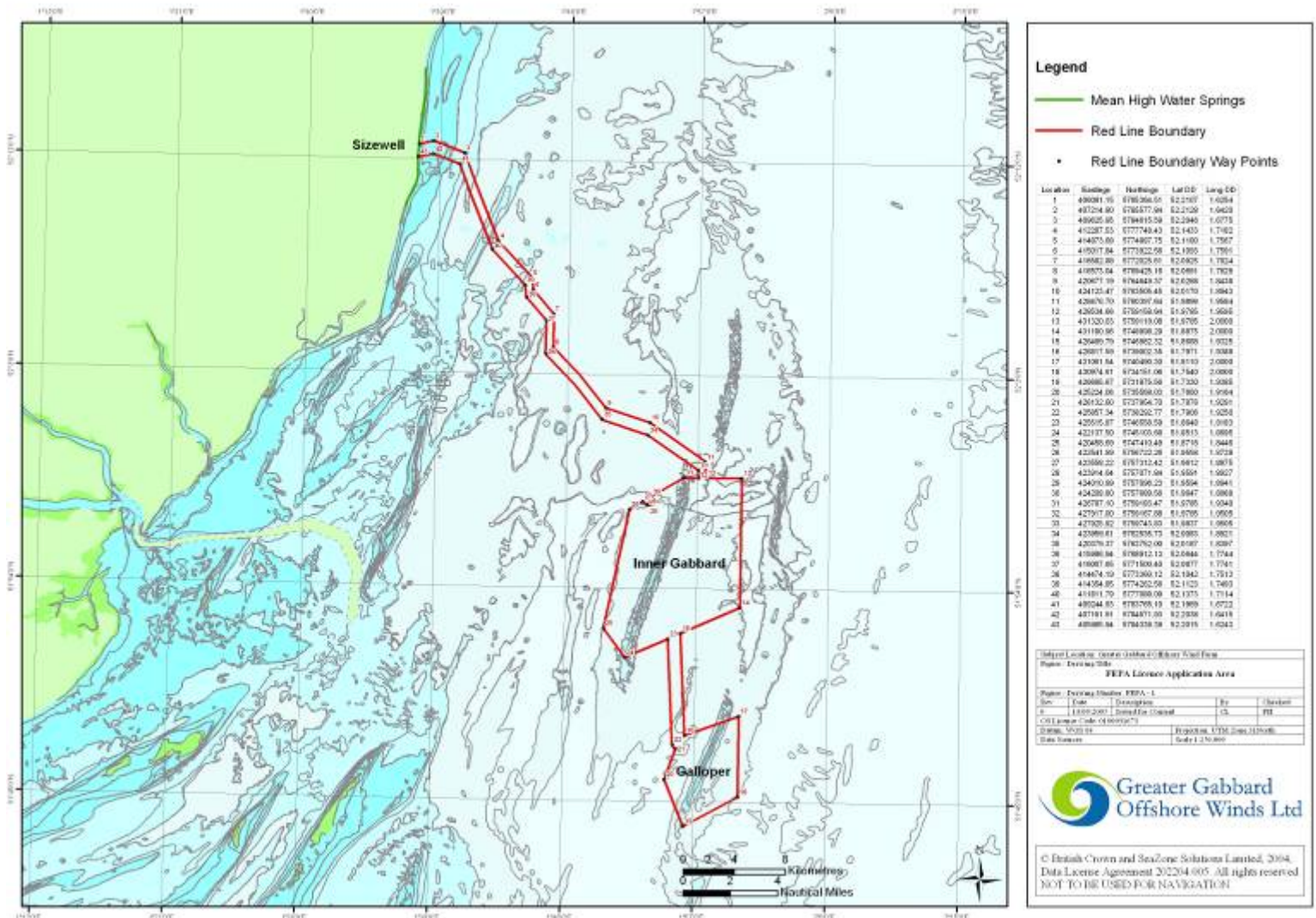
- 3 alternatives under consideration
- Monopile
  - Diameter: up to 6.5m
  - Length: monopile up to 57m + transition piece up to 39m
  - Weight: monopile up to 775 tonnes + transition piece up to 430 tonnes
- Tripod
  - Pile diameter: up to 2.1m
  - Pile length: up to 65m
  - Total weight: structure up to 770 tonnes + piles up to 350 tonnes
- Gravity Base
  - Shaft diameter: up to 5.5m
  - Base width: up to 36m
  - Concrete mass: up to 4600 tonnes
  - Ballast volume: up to 6000m<sup>3</sup>





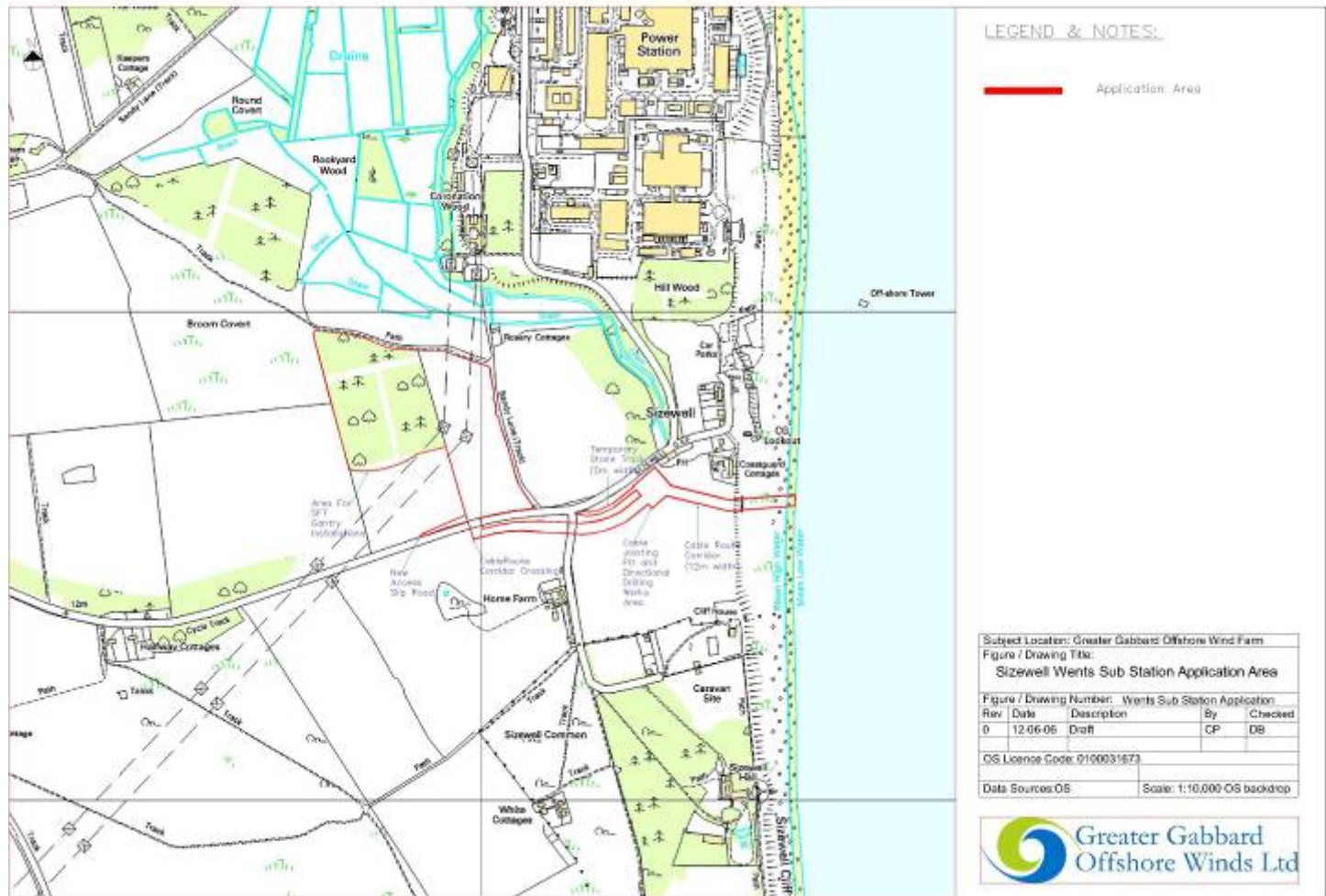
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## Export Cable Route



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## Onshore Works







## Offshore Wind Farm O&M

- Offshore O&M costs are typically £30 – 35k/MW/yr
- Onshore components
  - Substation
  - HV Cable
  - DCS
- Offshore components
  - Turbine Generator
  - Tower and Foundations
  - HV and LV Cable
  - Transformers



## O&M Strategy Considerations

- Onshore or offshore based
- Location of logistics base
  - Distance of wind farm from nearest harbour & facilities available
  - Offshore accommodation requirements:
    - Permanent Offshore Accommodation
    - Offshore support vessel
- Accessibility & Response Time
  - Wave Height & Current Speed
  - Seasonal Weather
- Vessel Hire / Ownership
  - No. of Support Vessels
  - Capability of Support vessels

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## Summary

- 500 MW offshore windfarm in the Outer Thames Estuary, UK
  - Significant contribution to the UK Government's renewable energy targets
- Up to 140 turbines
- 45km Export Cable route
- Connecting to the Grid at Sizewell
- Submitted consents application October 2005
- EPC Contractor appointed
- Advisers appointed
- One of the first offshore wind farm project to be project financed
- Commence construction in 2009 (subject to consent)