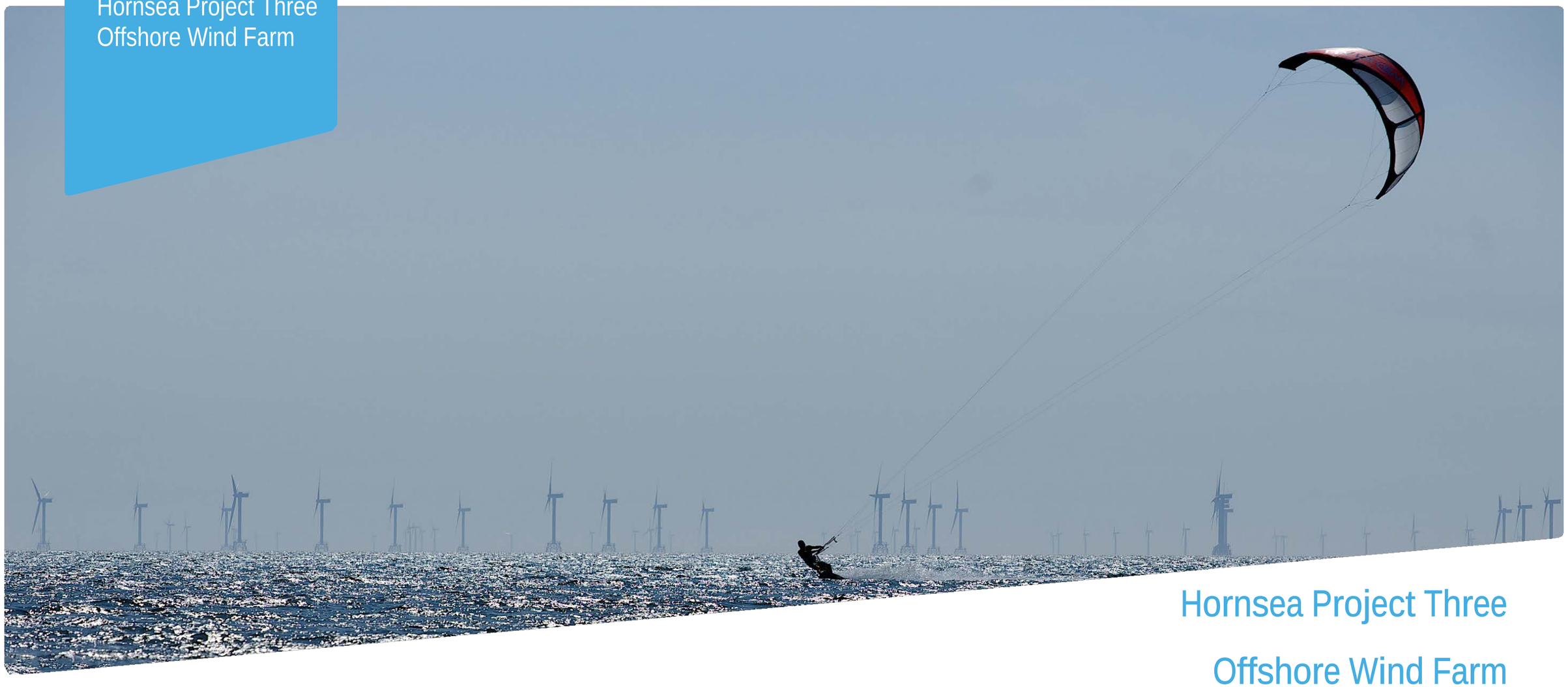
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Environmental Statement:
Volume 4, Annex 4.4 – Post PEIR Changes to Hornsea Project Three (Stages 8-9)

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Hornsea 3
Offshore Wind Farm

Ørsted

Environmental Impact Assessment

Environmental Statement

Volume 4

Annex 4.4 – Post PEIR Changes to Hornsea Project Three (Stages 8-9)

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Table of Contents

List of Tables

List of Figures

Glossary

Term	Definition
County Wildlife Site	A County Wildlife Site is a conservation designation in the United Kingdom, which although has no statutory protection, the name does affirm a site's importance and value for wildlife in its county context.
Special Site of Scientific Interest (SSSI)	A Site of Special Scientific Interest (SSSI) in Great Britain is a conservation designation denoting a protected area in the United Kingdom. SSSI are the basic building block of site-based nature conservation legislation and most other legal nature/geological conservation designations in the United Kingdom are based upon them.
Transition Joint Bays	Below ground chambers at landfall, where marine cables come ashore, and are jointed with the terrestrial cable system.

Acronyms

Acronym	Description
AC	Alternating Current
CWS	County Wildlife Site
DC	Direct Current
DCO	Development Consent Order
ECR	Export Cable Route
FOCI	Features of Conservation Importance
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
LPA	Local Planning Authority
MCZ	Marine Conservation Zone
MOD	Ministry of Defence
NGET	National Grid Electricity Transmission
NSIP	Nationally Significant Infrastructure Project
PAMS	Planning Application Monitoring
PC	Principal Contractor
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
s42	section 42

Units

Unit	Description
ft	Feet (length)
km	Kilometre (length)
m	Metre (length)
m^2	Square metre (area)

1. Introduction

1.1 Introduction

1.1.1.1 This annex describes the refinement of the Hornsea Project Three Offshore Wind Farm (hereafter referred to as Hornsea Three) onshore export cable route (ECR) and associated infrastructure[1] between the publication of the Preliminary Environmental Information Report (PEIR) in July 2017 through to submission of the Development Consent Order (DCO) in May 2018.

1.2 Purpose of the annex

1.2.1.1 Following publication of the PEIR, the project continued to be developed as it progressed towards the application for Development Consent. Ørsted continued to engage informally with stakeholders as part of the section 42 (s42) consultation process and beyond, through to the present application.

1.2.1.2 The purpose of this annex is to detail how the project has responded to consultation feedback through consideration of further engineering, commercial and environmental investigations in order to progress the project design and the selection of preferred options.

1.2.1.3 Feedback during Phase 2.A Statutory Consultation (July 2017-September 2017) saw the following onshore project components subject to further refinement:

- Landfall Zone refinement and ECR options in the vicinity of Weybourne;
- Onshore HVDC converter/ HVAC substation refinement;
- A preferred Onshore ECR search area including consideration of alternative route options;
- Onshore HVAC booster station refinement; and
- Four potential locations for construction compounds.

1.2.1.4 This in turn led to further Statutory Consultation (Phase 2.B) on alternative routes (November 2017-December 2017 which considered:

- Proposed access routes;
- Potential onshore ECR corridor re-routes;
- Potential storage areas;
- Additional area of potential visual screening around the HVAC Booster Station;
- Potential footpath diversion near landfall; and
- Two potential offshore alternative routes (considered within Annex 4.2 - Selection and Refinement of the Offshore ECR and HVAC Booster Station (Stages 4-9).

1.2.1.5 Following feedback to Phase 2.B, a focussed Phase 2.C consultation considered 6 minor onshore amendments prior to finalisation of the application (red line) boundary of the project as set forward within volume 1, chapter 3: Project Description.

1.2.1.6 For further background information on project elements, site selection and alternatives this annex should be read in conjunction with the following documents:

- Volume 1, chapter 3: Project Description;
- Volume 1, chapter 4: Site Selection and Consideration of Alternatives;
- Volume 4, annex 4.1 – Grid Connection and Refinement of the Cable Landfall (Stages 3-4);
- Volume 4, annex 4.2 – Selection and Refinement of the Offshore ECR and HVAC Booster Station (Stages 4-9); and
- Volume 4, annex 4.3 – Refinement of the Onshore Cable Corridor and Associated Infrastructure (Stages 5-7).

[1] This includes onshore HVDC converter/HVAC substation, HVAC booster station, construction compounds and access routes.

2. Final onshore refinements from post PEIR to application

2.1 Introduction

2.1.1.1 Following consultation on the alternative route options, it was considered that the s42 and Phase 2 consultation (including Phases 2.A, 2.B and 2.C) did not raise any substantive issues for the overall route of the proposed onshore ECR.

2.1.1.2 Work on the finalisation of the ECR and associated project infrastructure was therefore progressed, taking on board feedback on localised matters where this was viable. The entire ECR was subject to Orsted's 'Change Control' review process with every request for a change to the route, assessed by a multi-disciplinary team.

2.1.1.3 The modifications to the consulted route that were taken forward as part of the final application boundary (the red line boundary) and assessed in this Environmental Statement, have been predominantly made in response to the following:

- The need for further refinement of the landfall following the identification of localised technical and environmental constraints set out within Figure 2.1;
- The need to define a final route corridor, and reduce the broad 200 m corridor down to a final 80 m route corridor (60 m for the cable width, plus working areas either side totalling 20 m);
- Responding to consultation feedback and requests. This has influenced many of the post PEIR route refinements;
- The need to future proof the project by identification of new environmental designations and planning applications/allocations;
- The requirement for storage areas, secondary construction compounds, main construction compounds and cable construction access routes to provide access to the ECR off the public highway following the identification of Horizontal Directional Drilling (HDD) locations (or other trenchless techniques) and 'lock out' points;
- Design refinements to the HVAC converter/HVDC substation and HVAC booster station; and
- Proactive changes to the cable route using the results of detailed ecological and archaeological surveys to inform the detailed route selection.

2.2 Approach and Key Guiding Principles

2.2.1.1 A range of design refinements were made through the study area or micro siting along the ECR to optimise the design for all stakeholders. These have been determined and influenced by a number of Key Guiding Principles. These principles are listed below, although the application of professional judgement was often required in order to strike the appropriate balance when one or more conflicts occurred. This was undertaken in an iterative manner during interdisciplinary workshops with a range of topic specialists:

- Use of HDD. This was one of the key principles, as the use of HDD has been applied wherever necessary in order to allow trenchless installation and reduce potential ecological and social impacts e.g. it negates the need for extensive tree removal, avoids within stream/river impacts, or the need for road/rail closures and public/commuter disturbance. The final preferred route of the ECR proposes to use in the order of 100 HDD installations, which would significantly reduce the environmental and socio-economic effects of the project;
- Lining up the approach of a HDD so that it approaches a constraint e.g. roads, rivers, pipelines, at as close to 90 degrees as possible is preferred. This approach minimises design requirements, costs, distance and risk. HDD can generally be undertaken over extents of less than 200 m without significant technical complications, subject to this correct alignment which is optimally 90 degrees;
- Listening to landowner and farmer requests and preferences, such as keeping to field boundaries if possible or avoiding the more productive fields;
- Avoidance of railways embankments as they can pose additional technical complications;
- Avoidance of residential areas and close proximity to houses (and gardens) as much as possible;
- Avoidance of recreational sites e.g. camp sites and Public Rights of Way (PRoW);
- Avoidance of drainage ditches and the need to cross small lanes, in order to reduce HDD requirements, road closures or commuter/vehicle disturbance;
- Avoidance of Listed Buildings and Scheduled Ancient Monuments, with the implementation of a maximum viable buffer.;
- Minimisation of pinch points along the route where the cable route and/or working areas may be constrained in width;
- Avoidance of known planning applications and planning allocations or areas that are likely to be approved for new housing or road improvements where possible. This was done via monthly Planning Application Monitoring (PAMS); and
- Aim to minimise large route diversions (where possible) to minimise the need for additional environmental studies (that had not already been assessed in the PEIR), as well as to minimise and not extend the overall length of the ECR.

2.3 The approach to micro-siting of the cable

2.3.1.1 Additionally, detailed micro-siting of the central 80 m route was informed by a balance of the following factors:

- Avoidance/minimisation of tree and hedgerow loss/removal using the results of a detailed ecological/ arboricultural survey of tree quality and age;
- The results of an archaeological walk over along the preferred route;
- Keeping to field edges and boundaries wherever viable to minimise impacts;
- Minimising HDD bend radius to reduce design risks;
- Minimising the number of landowners affected by avoiding just clipping additional landownerships or field boundaries; and
- Bypassing and skirting ancient woodland and maximising the intervening buffer.

2.4 Refining the onshore cable route from 200 m down to a preferred 80 m corridor

2.4.1.1 The following section provides a small number of examples to help illustrate how the detailed refinement of the cable route has been undertaken, and how the Key Guiding Principles and approach to micro-siting have been applied (see also Figure 2.1, Figure 2.2 and Figure 3.2).

2.4.1.2 In certain areas the width of the ECR corridor was either extended or reduced depending on the specific location, for example at:

- The historic railway crossing near Kelling Heath and the A11 and Network Rail line joint crossing near Hethersett, where a wider corridor is required due to the potential need to separate the circuits to single HDDs for each cable as there may be an increased risk of settlement for larger HDDs;
- The point of crossing the Vanguard Project ECR where a wider corridor was required to allow for greater splaying of cables due to the potential thermal interaction between each project's cables; and
- Little Melton where it has been slightly narrowed to avoid impact on a public open space.

2.4.2 Technical challenges at landfall

2.4.2.1 The preferred route of the cable landfall and temporary landfall compound was identified following review of a number of technical and environmental factors both onshore and within the nearshore area along the coast. The preferred route which is shown within the red line boundary on Figure 2.2 was eventually selected for the following reasons:

- The offshore ECR avoids the chalk reef identified in the Features of Conservation Importance (FOCI) habitat map for the Marine Conservation Zone (MCZ) (See Volume 4, annex 4.2 for further information);
- It was possible to avoid a greater proportion of the MCZ via the offshore ECR routing to the west of the MCZ;
- The onshore route is much less constrained than the more easterly route that was also assessed;
- It allows room to accommodate the Transition Joint Bay area;
- It removes two crossings of the Sheringham Shoal cables and any need for close proximity working to these cables; and
- The route is straighter than the alternative route that was considered and removes the sharp bends and numerous shallow bends that would have been required on that route.

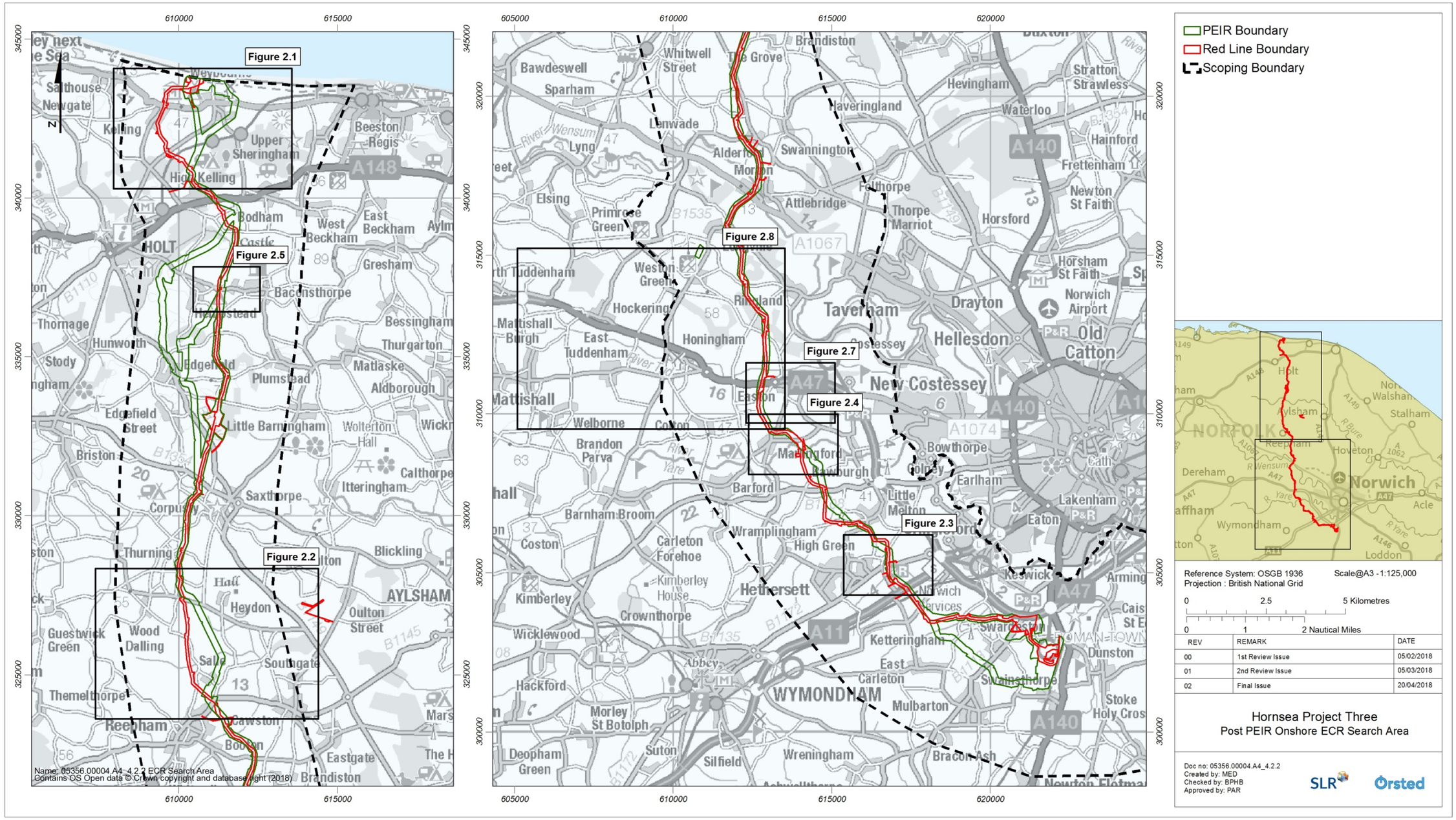

Figure 2.1: Post PEIR Onshore ECR Search Area.

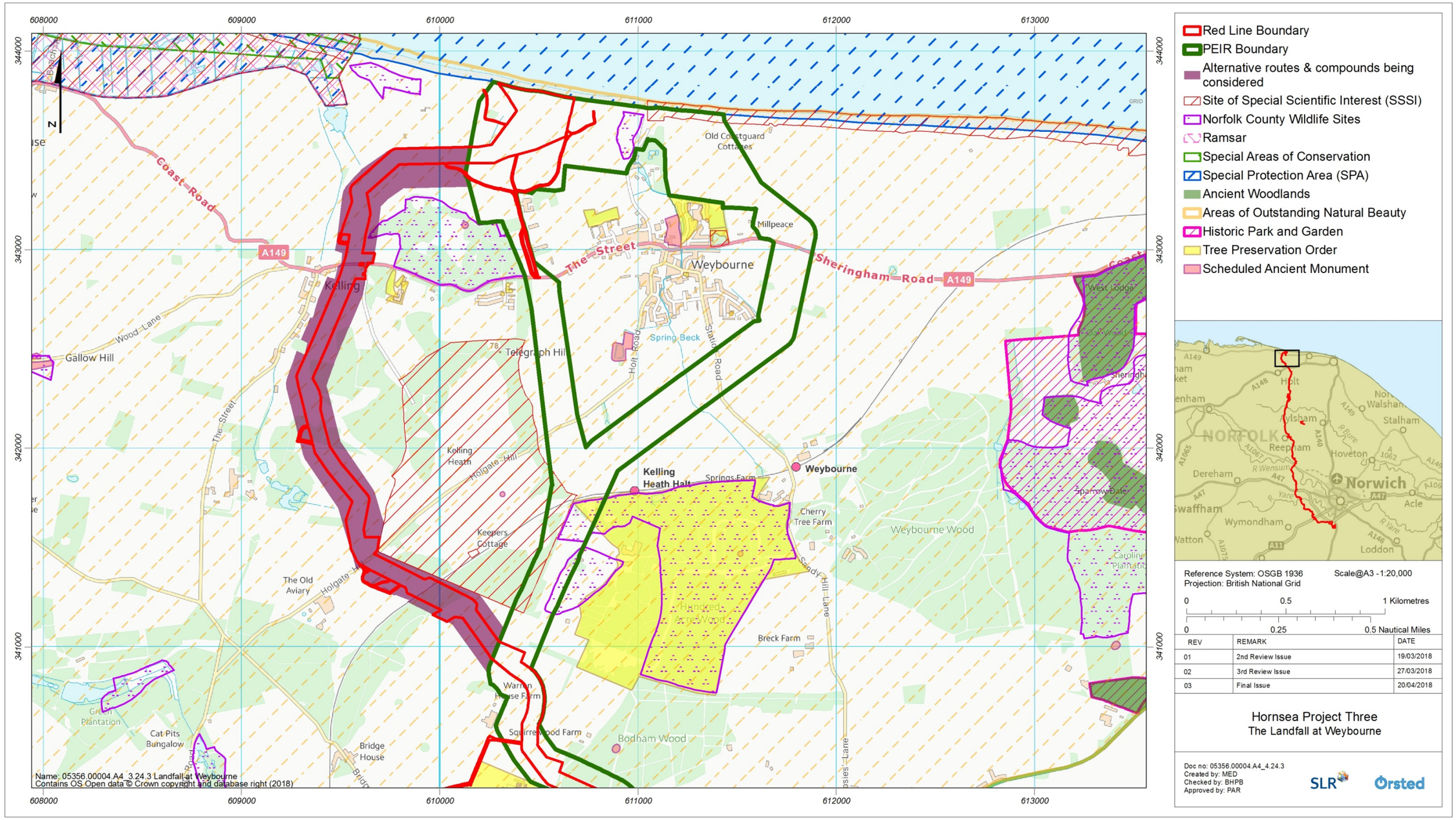

Figure 2.2: The Landfall at Weybourne.

2.4.3 Dealing with uncertainties and listening to consultation feedback

2.4.3.1 Consultation feedback provided new localised information that informed route decisions, for example:

Example A: Pitt Farm Campsite, to the east of Hempstead

2.4.3.2 The PEIR consultation identified a new campsite with access track, to the south of The Street, on the western extremity of Baconsthorpe, on land owned and operated by the owners of Pitt Farm. The landowners also identified a marl pit within a field to the north of The Street, which was between 20 to 30 ft (approximately 6-9 m) in depth. The landowners requested that the ECR avoid the campsite as much as possible in order to minimise any impact on the campsite business during cable construction works. After consulting on the proposed re-route in the Phase 2.B consultation, the landowner feedback was that it could be subject to a further move west, which was agreed and consulted on again in the February focussed Phase 2.C consultation. Figure 2.3 shows the realignment of the final 80 m ECR in order to avoid the marl pit and the campsite.

Example B: MOD pipeline

2.4.3.3 The status of an unknown special category pipeline to the east of Hethersett was raised as part of Phase 2 consultation. Figure 2.4 (below) shows how it routes within a significant portion of the proposed 200 m ECR corridor. If the pipeline were found to be 'live' it could have significantly affected the design and location of the final ECR route. Consequently, the special category pipeline was initially identified as a disused MOD pipeline with the potential to cause significant technical difficulties. In light of this information an alternative route was proposed and presented as part of the Phase 2.B consultation.

2.4.3.4 Subsequently, the status of the pipeline was confirmed as abandoned by the MOD. Following this confirmation the proposed ECR route was refined and realigned to primarily fall within the former PEIR ECR corridor.

Example C: Potential re-route around Little Melton

2.4.3.5 The area surrounding Little Melton is constrained by a number of County Wildlife Sites (CWS) (Low Common, Braymeadow and Beckhithe Meadow). An ECR corridor was initially selected using agricultural fields between the settlements of Little Melton and Hethersett. A route to the north was discounted due to the built up nature of land around the B1108/A47 junction while a route further south was discounted due to land being allocated for housing[2] with an extant planning consent for c.1,200 dwellings plus associated infrastructure[3]. It was determined that the ECR proposed within the PEIR provided a reasonable route around environmental constraints acknowledging that it passed in close proximity to a Grade II* Listed church.

2.4.3.6 Informal discussions with the landowner presented a revised route suggestion. However, this was considered to be unfeasible due to the proximity of Little Melton Food Park, App. Ref. 2011/1804, pinch points between pockets of woodland, and the nearby NGET (National Grid Electricity Transmission) high voltage overhead line.

To strike a balance between the landowners concerns, survey results and environmental constraints, combined with the concerns of residents, an alternative ECR corridor option was established and subsequently presented at Phase 2.B consultation (See Figure 2.5). This route was discussed and agreed with the landowner, and involved HDD under the CWS to ensure that any potential ecological impacts were minimised.

2.4.4 Responding to changes in policy/designation

2.4.4.1 Inevitably there is a changing policy environment for the Hornsea Three project and in this example a nature conservation designation was extended.

Example D: Extension to a CWS on the River Yare

2.4.4.2 In November 2017 a CWS was extended on the River Yare to the east of Marlingford. The CWS was designated on the grounds of the ecological value of the meadows and marshes. The open cut trenching that had been proposed throughout this area within the PEIR would therefore have resulted in a major ecological impact on this newly designated area.

2.4.4.3 Figure 2.6 shows the extent of HDD that was proposed within the PEIR, which would have been supplemented by open cut trenching along the remaining portion of the ECR. The figure also shows the new proposals to HDD under the entire CWS designation.

2.4.5 Challenges in the face of a changing landscape

2.4.5.1 In order to future proof the design of the project, Planning Application Monitoring (PAM) has been undertaken on a monthly basis since January 2012. This captured all planning decisions within the onshore search corridor, plus a 200 m buffer. The aim of this monitoring was to identify all planning permissions capable of being implemented within the onshore ECR. The PAMs information that has been captured was very detailed, including detailed location maps, status of the application and links to the planning application portal. PAM covered Nationally Significant Infrastructure Projects (NSIP), Local Planning Authority (LPA) and County Matter applications, as well as minerals and waste projects. The onshore PAMs was collated from the following sources:

- The Planning Inspectorate;
- North Norfolk District Council;
- Broadland District Council;
- South Norfolk District Council; and
- Norfolk County Council.

[2] Policy HET 1: Land north Hethersett - South Norfolk Local Plan Site Specific Allocations and Policies Document (Adopted October 2015)
[3] Application Reference: 2011/1804

Figure 2.3: Listening to Consultation Feedback from Pitt Farm.

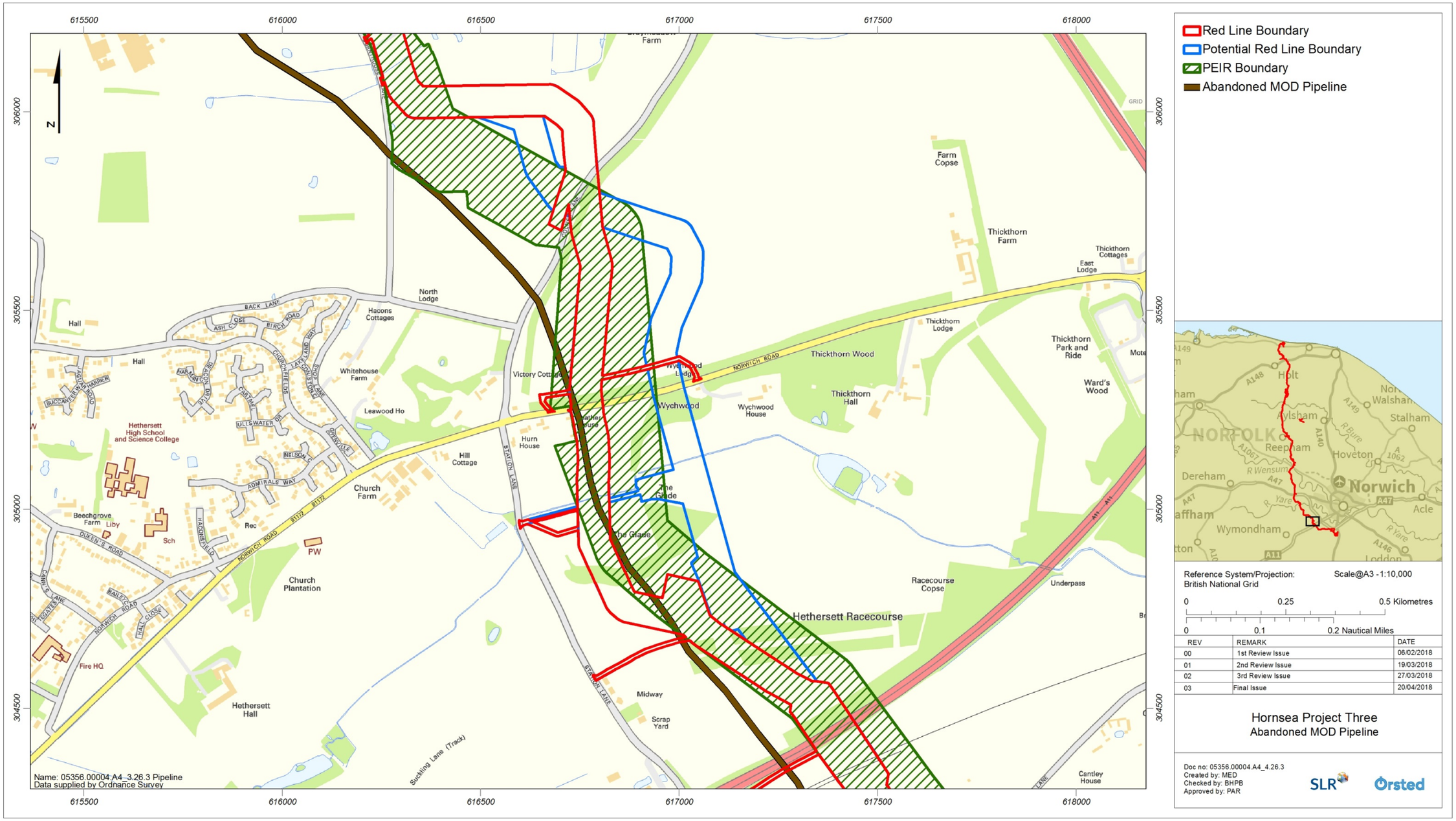

Figure 2.4: Abandoned MOD Pipeline.

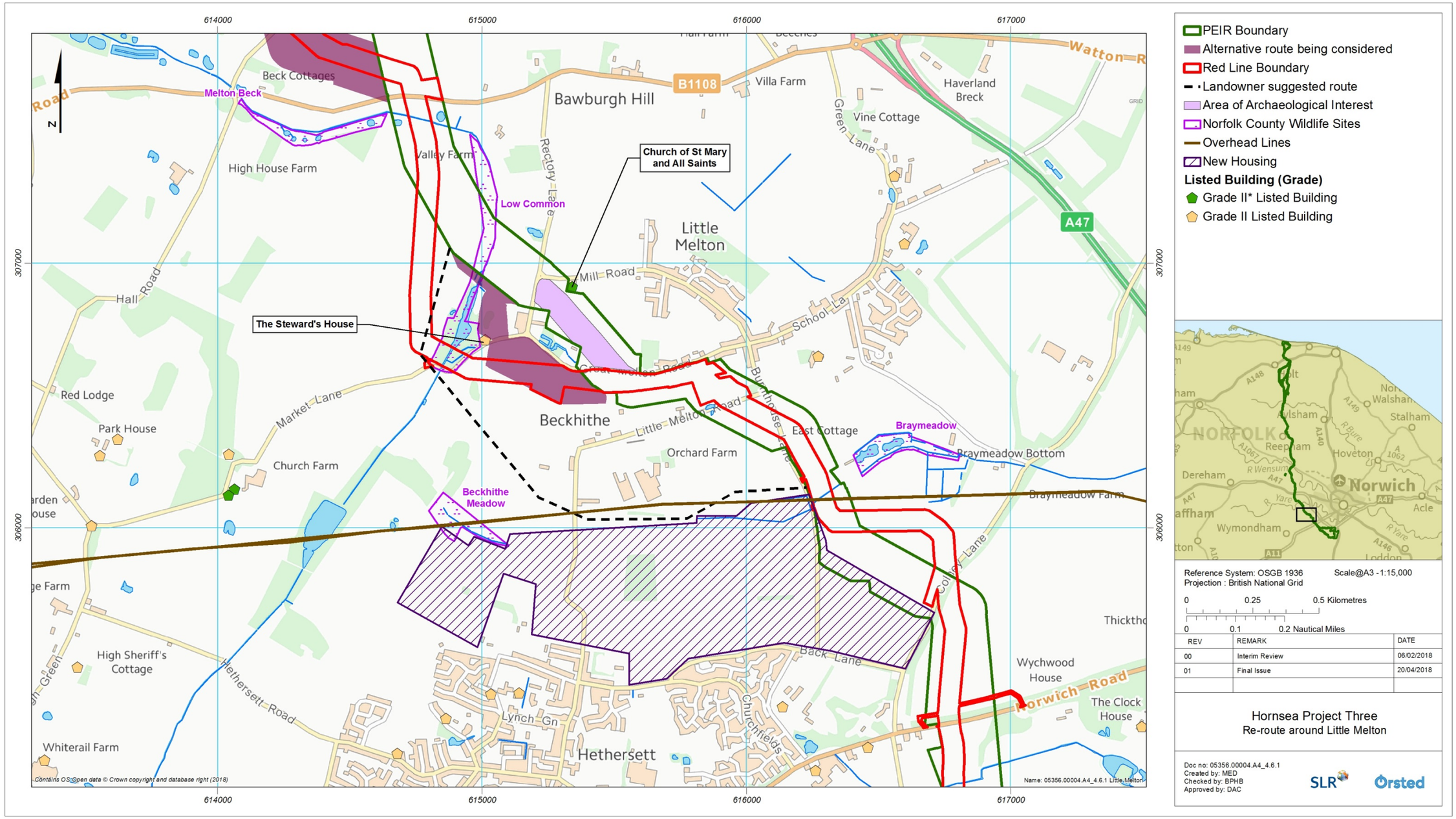

Figure 2.5: Potential re-route around Little Melton.

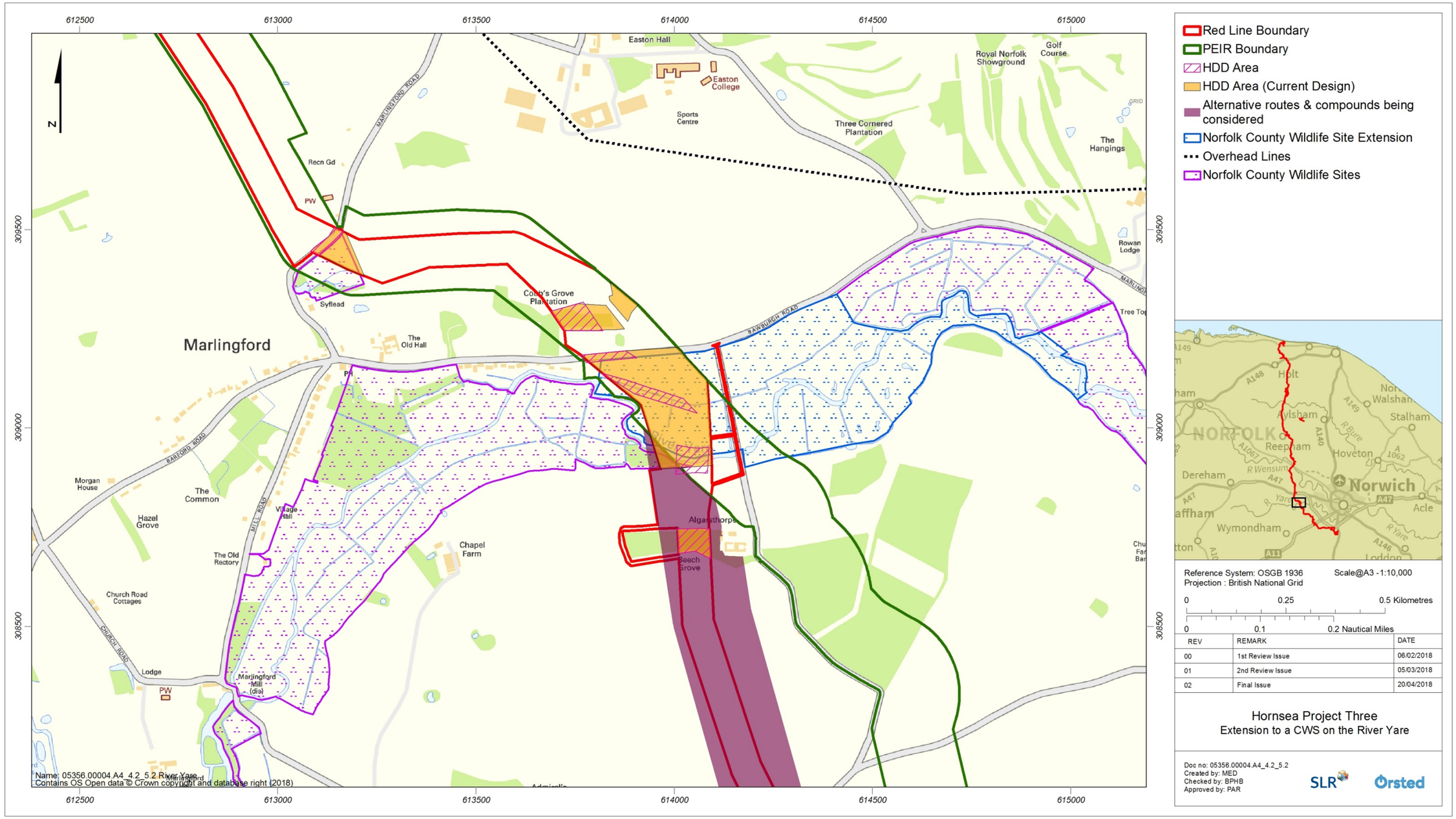

Figure 2.6: Extension to a CWS on the River Yare.

2.4.5.2 The purpose of the PAMs was to aid in the design of the ECR and enable the chosen route to avoid all planning applications that could be located in close proximity to, or could directly impact upon the proposed ECR. In the event that a new planning application was identified and it introduced a significant design hurdle, the project would aim to work with landowner and/or applicant to identify a mutually acceptable solution.

2.4.5.3 The following paragraphs provide two of examples which help to illustrate the project's approach to cable design within a challenging and changing landscape.

Example 1: New housing development south & east of Easton

2.4.5.4 On the 1st November 2016 outline planning consent was granted for the erection of 890 dwellings; the creation of a village heart which would feature an extended primary school, a new village hall, a retail store and areas of public open space; the relocation and increased capacity of the allotments; and associated infrastructure including public open space and highway works in Easton, Norfolk. (Planning reference: 2014/2611 on Land North And South Of Dereham Road Easton Norfolk).

2.4.5.5 This outline planning consent covered the land hatched in purple on Figure 2.7 below. The indicative cable route under consideration at that time is also shown on the figure as a dashed black line.

2.4.5.6 It can be seen that if the planning application had not been monitored and identified, that the proposed cable route would have been designed to route right through the eastern side of the housing development.

2.4.5.7 Once the new housing development was confirmed the ECR was re-aligned further to the west. Other planning applications have been identified at other locations along the route and have influenced the preferred routing of the cable. Example 2: New highways improvements – A47 from North Tuddenham to Easton.

2.4.5.8 Highways England is proposing to upgrade and dual the A47 between North Tuddenham to Easton as shown on Figure 2.8. These works including junction upgrades are likely to commence in 2021-2022 and would cover an extensive breadth of land on either side of the A47 road. In order to accommodate these upgrades, should there be an overlap in project construction programmes, the Hornsea Three ECR would need to be aligned at 90 degrees to the A47 in order to successfully HDD under these extensive works. The design of HDD and cable alignment was also further complicated in this location by the need to cross the River Tud approximately 350 m to the north of the A47. The ECR therefore had to be carefully aligned to allow a short change in orientation between the two separate HDD locations.

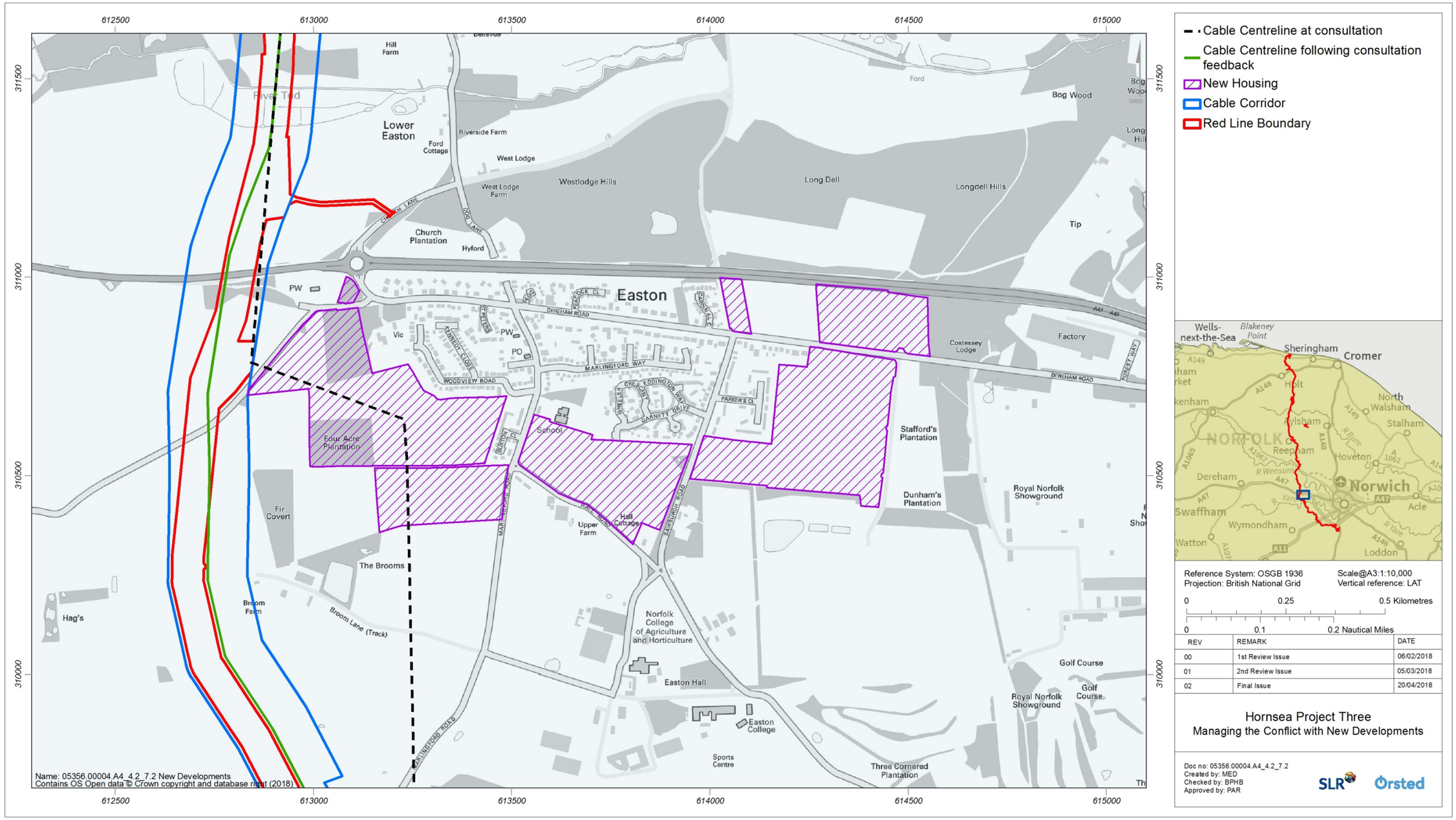

Figure 2.7: Managing the Conflict with New Developments.

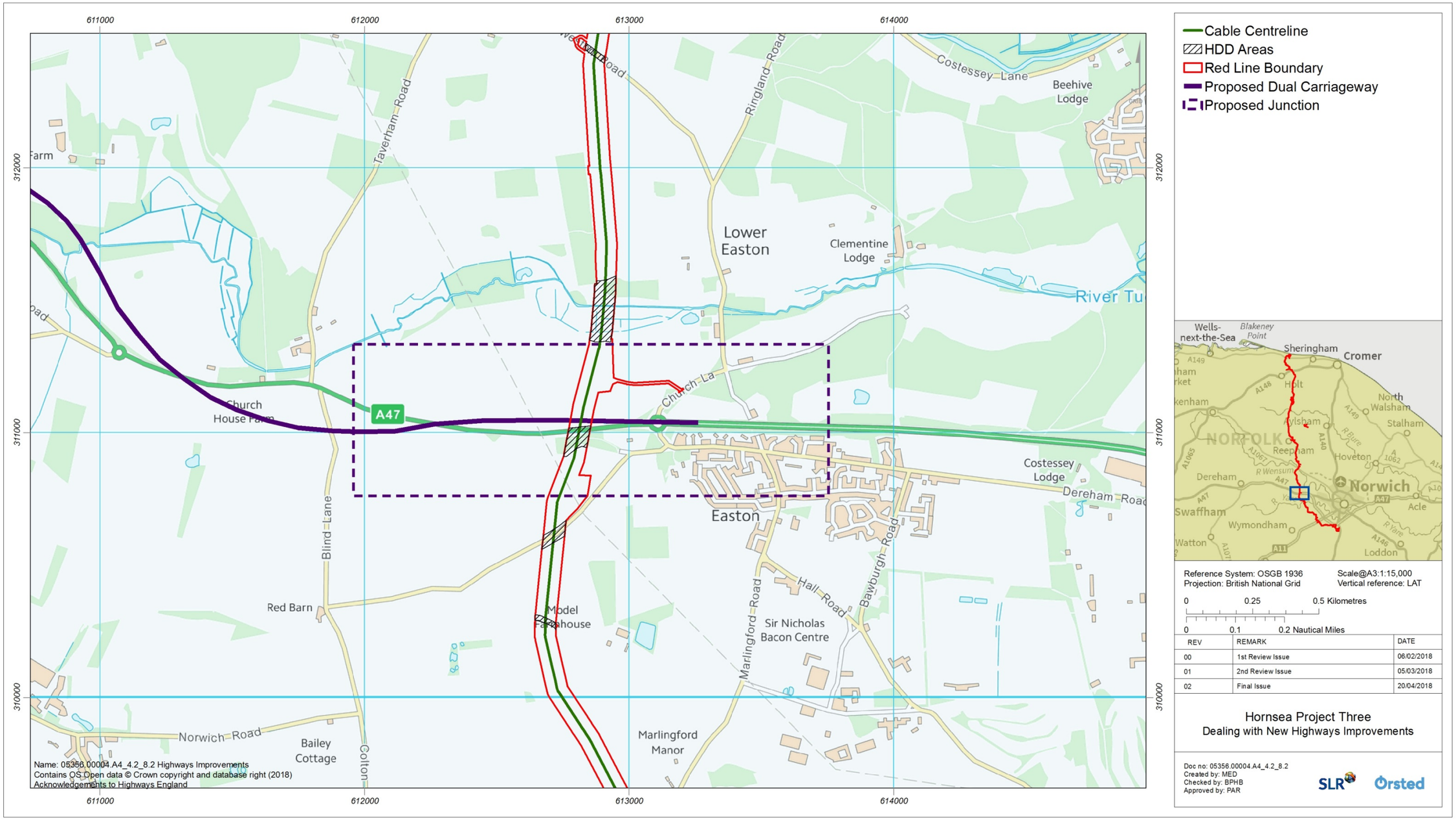

Figure 2.8: Dealing with New Highways Improvements.

3. Refinements to the onshore HVDC converter/HVAC substation and HVAC booster station with associated compounds

3.1 Background

3.1.1.1 As explained in volume 1, chapter 3: Project Description, an onshore booster station would potentially be required in the event that an alternating current (AC) electrical system is developed in order to mitigate transmission losses across the entire cable route. If a direct current (DC) electrical system is developed then neither the onshore or offshore booster stations would be required.

3.1.1.2 Within the present application, the preferred onshore HVAC booster station and HVDC converter/HVAC substation locations that were presented as part of the Phase 2 consultations have been slightly refined following additional detailed electrical design.

3.2 The HVDC converter/HVAC substation

3.2.1.1 The detailed requirements of the HVDC converter/HVAC substation (hereafter referred to as the substation) are provided within volume 1, chapter 3: Project Description. The permanent footprint of the building would need to be supplemented by the footprint of a temporary construction compound as shown in Figure 3.1. The purpose of the temporary construction compound is to support the construction of the substation. The compound would be typically established by and operated by the Principal Contractor (PC) and would be limited to the period required for the installation of the substation.

3.2.1.2 From Figure 3.1 it can be seen that the search area of the permanent footprint of the substation and associated compound have been rationalised and substantially reduced, from the larger search areas identified at PEIR. Additionally, following detailed electrical substation design, although the footprint of the substation itself has slightly increased, this has been undertaken to provide increased landscaping and rationalise the volume of ground works that would be required. The footprint for the temporary construction compound has been reduced down in size so as to minimise disturbance. The final alignment of the compound was chosen in order to place it directly adjacent to the permanent footprint of the substation and as far away from residential receptors as possible. A thin strip of land to the south of the substation has also been identified within the Development Consent Order (DCO) plans to enable the planting of a strategic landscape screening corridor. As the substation site is still subject to detailed design (and appropriate requirements added into the Draft DCO) limits of deviation have been established alongside areas set aside for landscaping solutions to assist in mitigating the visual impact of the structures.

3.3 The HVAC booster station

3.3.1.1 The detailed requirements of the HVAC booster station are also provided within volume 1, chapter 3: Project Description. The permanent footprint of the building, would need to be supplemented by the footprint of a temporary construction compound as shown in Figure 3.2. The purpose of which is to support the construction of the building and should be located adjacent to and in front (to the south) of the booster station. The compound would typically be established by and operated by the PC, and would be limited to the period required for the installation of the works.

3.3.1.2 From Figure 3.2 it can be seen that the footprint within which the booster station and associated compound could be located has been substantially reduced in extent from the larger search areas identified at PEIR. The alignment of the booster station has also been slightly adjusted to take further advantage of an existing belt of trees that lies immediately to the north, and to locate the building onto the lowest lying, flat land, in order to reduce the overall visual effect. The DCO plans also identify a strategic landscaping corridor to allow for additional tree planting and visual screening of the booster station.

3.4 Selection of the temporary construction compounds

3.4.1.1 At the substation and booster station, the PC may draw on both the permanent land take area and the temporary compound area to facilitate construction works. The location of the temporary compounds have been selected specifically to comply with the following requirements:

- Located as close to, if not immediately adjacent to the permanent land take area;
- The land is ideally flat, although some topography differences could be provided for;
- The selected areas avoid the removal of trees as these are required to screen the permanent structures;
- The areas avoid other structures such as overhead lines and pipelines; and
- The site makes use of one access point.

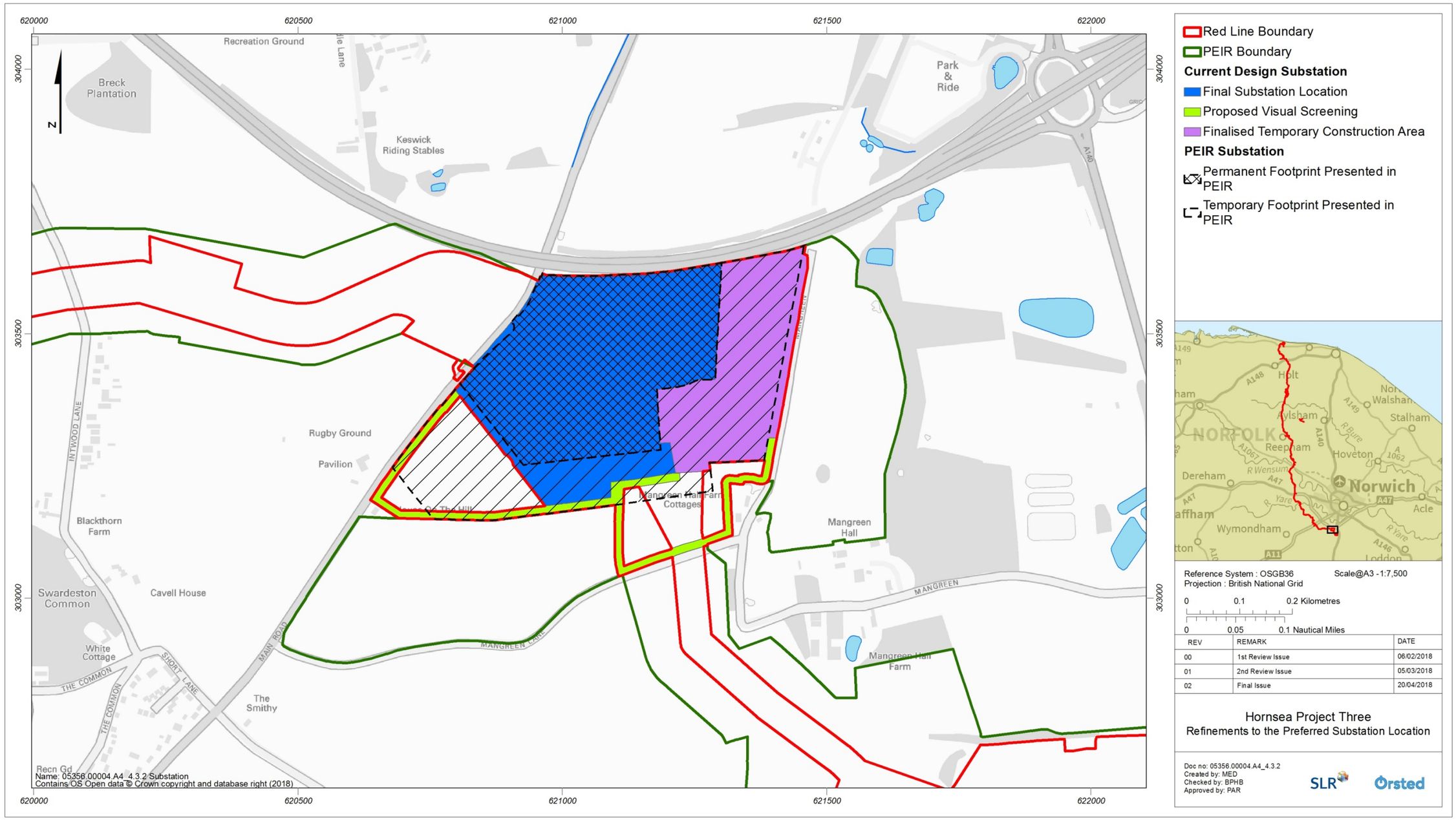

Figure 3.1: Refinements to the Preferred Substation Location.

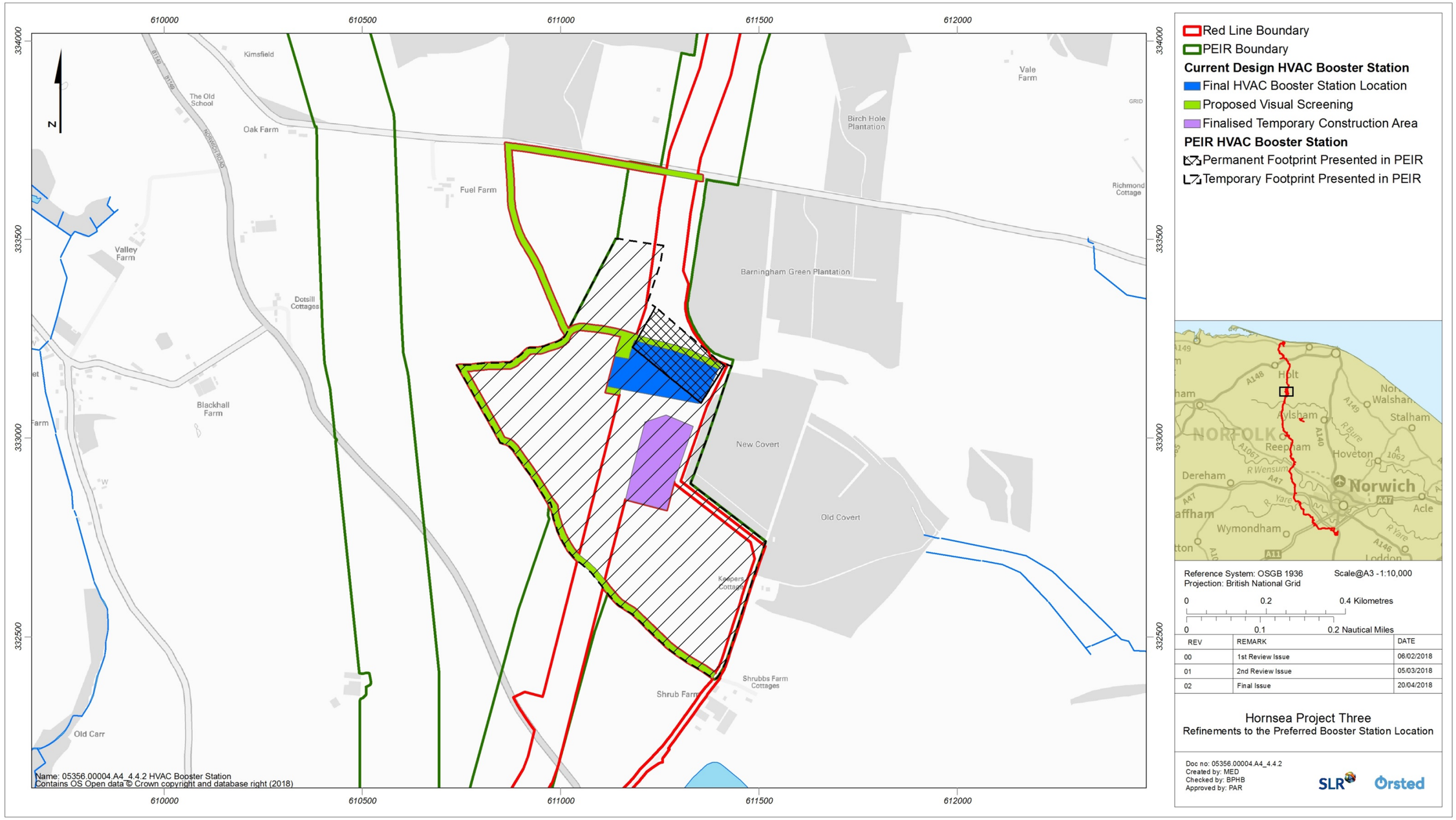

Figure 3.2: Refinements to the Preferred Booster Station Location.

4. Additional Compound Strategy

4.1 Introduction

4.1.1.1 The current application provides for a hierarchy of construction compounds. In addition to the substation and HVAC booster station compounds, the following onshore compounds would also be required:

- Landfall temporary construction compound;
- Main construction compound;
- Secondary compounds; and
- Soil storage areas.

4.2 Landfall temporary construction compound

4.2.1.1 A temporary construction compound would be required at landfall, the purpose of which would be to support the landfall works. It would typically be established by and operated by the PC for the landfall works. The compound would be an extension to the permanent footprint and would be limited to the time period required for the installation of the landfall works. The precise location of the landfall compound has been determined by the technical, environmental, and commercial choice of the final cable landfall and as such it would be located in the same broad location as the Transition Joint Bays.

4.3 Main construction compound

4.3.1.1 The PC will require a main construction compound, although the specific requirements of the PC are currently unknown and would be determined on appointment of the PC, after grant of the DCO. This main compound would operate as a central logistics base for the onshore construction works, and would house the central offices, welfare facilities, and provide a security hub, central health and safety monitoring, and equipment stores, as well as acting as a staging post and secure storage for equipment and component deliveries. The infrastructure and facilities required for this central compound are described in volume 1, chapter 3: Project Description of this Environmental Statement.

4.3.1.2 The project took an early strategic decision to identify a main compound but also identified a number of secondary compounds providing localised welfare facilities and strategic storage areas along parts of the route.

4.3.1.3 The identification and selection of the main compound was undertaken using the following broad criteria:

- The approximate area required would need to be c. 40,000 m^2 in overall extent;
- The land should be located approximately midway along the ECR to provide a central location that would have access to primary road routes;
- The site need not necessarily be within or in very close proximity to the ECR but should have good access to the road network;
- A preference for an existing area of hardstanding to minimise the environmental effect of the land take; and
- The land should be available for the duration of the proposed ECR construction programme and not subject to additional commercial agreements.

4.3.1.4 Four potential sites were identified with three going forward for assessment within the PEIR. The final selected site can be seen in Figure 4.1.

4.3.2 Discounted sites

4.3.2.1 Site 1: Weston Longville. This site was located to the south west of Weston Longville to the north of an existing solar farm. The site had many positive attributes such as existing hard standing, a range of energy sources and it was a suitable size with some flexibility for design. However ultimately the site was not considered to have the required level of access to the road network, particularly for Heavy Goods Vehicles (HGVs). In addition, potential cumulative effects with the construction works for the A47 dualling works could not be ruled out. Concerns raised by local residents and the parish council finally meant the site was discounted from further consideration.

4.3.2.2 Sites 2 & 3 near to Cawston Road, south of Salle. These two sites benefitted from their location immediately adjacent to the proposed route of the ECR, almost centrally located along the onshore cable route. However from a negative perspective both sites were slightly separated from the principal road network which would place additional pressure on the local roads. Ultimately the sites were discounted for this reason and the risk of potential cumulative effects with other onshore ECR projects.

4.3.3 Selection of the final compound

4.3.3.1 The final site was put forward by the owners of Oulton Airfield, which is located off the B1149 near Oulton Street. The site already comprises hard standing suitable for the temporary placement of site facilities such as offices, briefing rooms, catering facilities, and storage which would be typically housed within port-a-cabins. This would allow plant and materials to be stored safely and securely, whilst material and non-static plant could then be transported out to the active cable installation areas as required. Although approximately 3.5 km to the east of the main ECR, the site is approximately at the mid-way point and is well placed to serve deliveries to the construction route. The site has previously been used as a construction compound for other construction projects, and has direct access from the B1149.

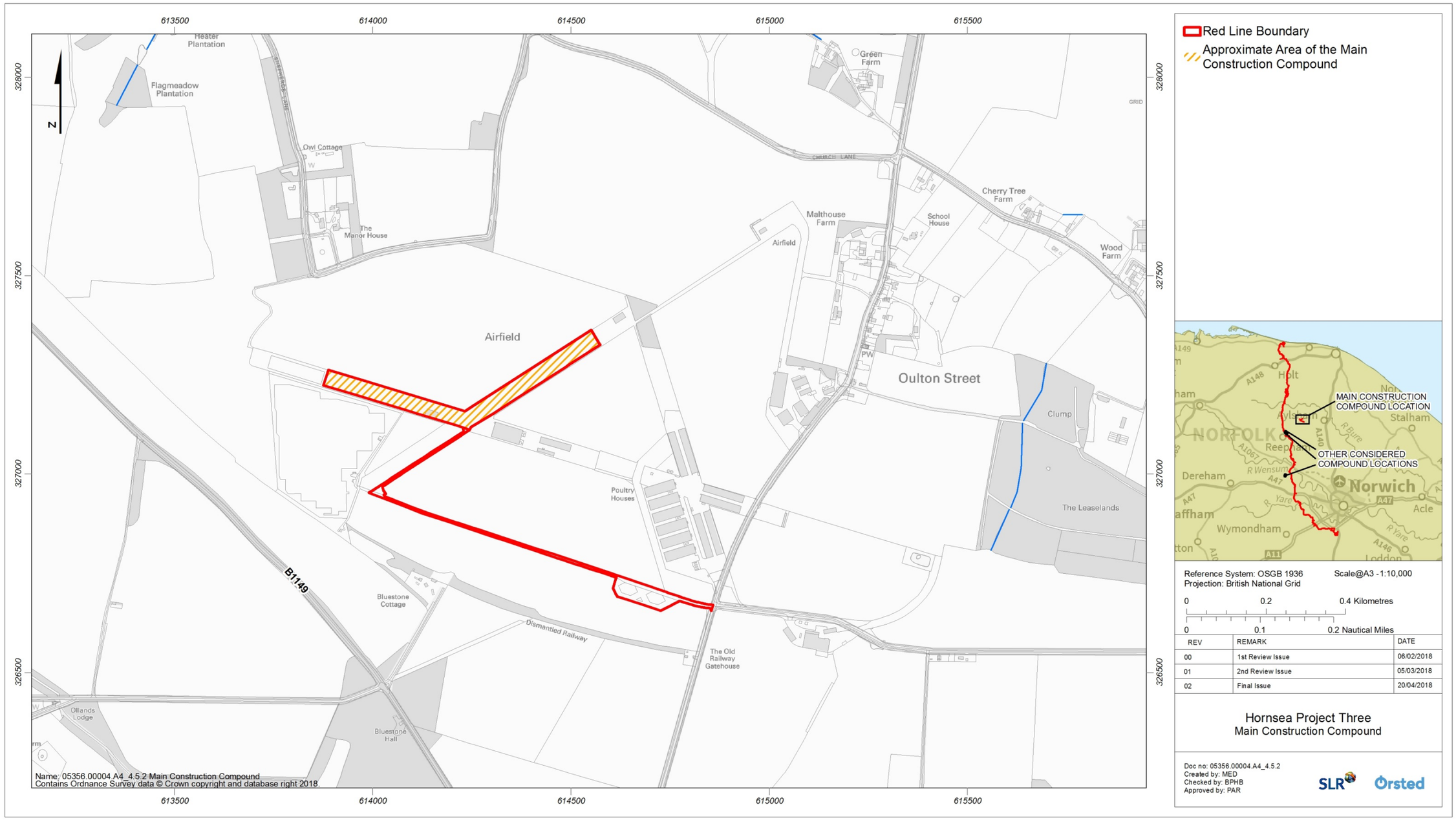

Figure 4.1: Main Construction Compound.

4.4 Secondary compounds

4.4.1.1 The PC will also require a series of secondary construction compounds which would need to be located strategically along the onshore ECR. These would operate as support bases for the onshore construction works as the cable work front passes through an area. They would provide localised welfare facilities and storage and would be likely to house portable offices, and act as a strategic staging post for localised secure storage of equipment and component deliveries.

4.4.1.2 Once the main construction compound had been identified, a number of secondary compound sites were identified within the red line application boundary see Works Plan (onshore) (application document reference A2.4.2). These sites are typically in agricultural use. They were selected on the basis that they provide logical and sensible locations, equally spaced along the ECR. Wherever possible they have been sited to avoid environmental constraints, are located away from sensitive receptors and closer to the more complex works such as HDD sites, ECR pinch points or restricted working areas. Where viable they have been located to fit into areas of land that might be temporarily severed or agriculturally redundant during the cable construction works e.g. the corners of fields.

4.5 Storage areas

4.5.1.1 The PC may require additional storage locations along the onshore cable route. These would operate as areas where some limited additional storage could be provided in addition to that land provided within the 80 m temporary corridor. Storage location sites would be restored to their original condition when the work front has passed.

4.5.1.2 The sites that have been identified are generally in agricultural use and would be located in areas that could not be used by the farmer because the cable installation works would have temporarily restricted access to these locations (see Works Plan (onshore) (application document reference A2.4.2)).

5. Identification and selection of access routes

5.1.1.1 The onshore access routes to the ECR were identified towards the end of the project programme, in order to ensure that they provided a viable and extensive network of access routes that could fully support the preferred route of the ECR and its associated cable compounds and storage areas. Those access points / storage compounds that extended beyond the previous consultation boundary were then consulted on as part of the Further Statutory Consultation (Phase 2.B) in late 2017. Since that consultation, the routes have been subject to further detailed adjustments in order to facilitate project construction works or minor route alterations.

5.2 Categories of access

5.2.1.1 Three main types of access routes would be required to facilitate the project:

- HGV and haulage access for construction goods and plant;
- Permanent access routes to the substation and HVAC Booster station; and
- Access for 4x4 vehicles to allow monitoring of the HDD locations.

5.3 Selection of access routes

5.3.1.1 As part of the design development process, undertaken concurrently to the statutory consultation (July 2017 to September 2017), the project undertook a study to identify feasible construction access points and additional construction land take requirements for the onshore ECR. In the identification of construction site access, the following were taken into account:

- Technical Constraints;
- Commercial/landowner constraints; and
- Environmental constraints.

5.3.1.2 The first step was to undertake an initial desktop exercise to identify a ‘long-list’ of potential site access routes based upon starting assumptions (i.e. the proposed route under development). A key principle was to keep to existing access routes and roads where ever viable, to minimise environmental and social impacts.

5.3.1.3 The long list was then refined following review by internal technical specialists (e.g. land rights, environmental and technical teams). The refined list was then investigated in greater detail and optimised or micro-sited, to confirm the feasibility of the identified access points. This included information from site visits undertaken by construction specialists as required. Throughout this process there was a need to be mindful of the evolving highways network, especially within the southern areas of the ECR, to limit cumulative effects with other highways works and ensure that the access routes would still be viable for the duration of the proposed construction programme.

5.3.1.4 Once 'project preferred' access points had been identified, these access points were then reviewed by the Hornsea Three Traffic and Transport specialists, as part of the initial stages of forming the Traffic and Transport Assessment with in the Environmental Statement. Through that process a colour coded risk rating was applied to each of the access point, from Severe Risk to Good Option as shown in Table 5.1.

Table 5.1: Access Route Risk Assessment.

Risk Level	Definition of Risk
Severe Risk	Road safety, environmental impacts and/or consenting risks are likely to remain after mitigation and traffic management is likely to be significant and may lead to objection from highways officers. Access to existing dwellings or units may be affected.
Significant Risk	Road safety, environmental impacts and/or consenting risks are likely to remain after mitigation and traffic management is likely to be significant and may lead to objection from highways officers.
Feasible Option	Road safety, environmental impacts and/or consenting risks may arise but it appears on balance that they are likely to be acceptable with appropriate mitigation and traffic management measures.
Good Option	Appears likely to be acceptable in terms of road safety with suitable measures and traffic management. Environmental effects and/or consenting risks appear capable of mitigation with traffic management.

5.3.1.5 Following this review the design of the access network continued to evolve, to remove any access points that were considered to present Severe Risks or Significant Risks to the project, either by removing them completely or by moving the proposed access point to a more suitable location.

5.3.1.6 As part of that access review, a wider review of the suitably of the access routes was also undertaken to ascertain if the access point would be accessible from the wider network. Key constraints that were considered included: height limitations (such as low bridges in and around landfall); or retired width; and access vehicle weight limitations. The selected access routes are shown in Access to Works Plan (application document reference A2.5).

5.3.1.7 Across the footprint of the onshore project, road and track upgrades, road widening and highways improvements would be likely to be required in many locations, in order that the access routes could be designed and constructed to meet the specific health and safety requirements of the cable construction corridor and its associated plant. Additional information on these requirements is provided within volume 3, chapter 7: Traffic and Transport.

6. Conclusion

6.1.1.1 Following Statutory Consultation the following refinements were made to the Project:

- A small number of refinements and re-routed sections of the preferred onshore ECR search area of 200 m in width;
- Refinement of the 200 m corridor down to 80 m.
- Refined landfall and re-route to the west at Weybourne with access route;
- HVAC Booster site orientation and layout refinement;
- HVDC Convertor / HVAC Substation site orientation and layout refinement; and
- Identification of the preferred Main Construction Compound at an existing airfield near Oulton with identified access route.

6.1.1.2 Some of these alterations (which had not been consulted on at PEIR), required the proposed ECR to fall outside of the PEIR corridor. Further Statutory Consultations were therefore held to consult on these changes and to inform the public and relevant stakeholders of the proposed alternative route options and design adjustments.

6.1.1.3 The final cable route as presented within this Environmental Statement is the result of multi-disciplinary workshops, discussions and decision making across the entire route, in order to balance a wide range of environmental, technical, economic and social effects, to drive and derive the final ECR choices. Decisions made by the multi-disciplinary team in response to consultee comments and feedback, detailed technical, commercial and environmental studies, have directly informed the preferred route alignment and selection of the HDD locations.

6.1.1.4 The optimum route for an onshore grid connection can be considered to be the shortest route from A to B; from landfall to the main NGET substation. The final route presented within this Environmental Statement is considered to effectively achieve this optimisation, within the environmental, technical and social constraints that have been identified along the proposed cable route corridor. The final route and DCO plans for the Hornsea Three application are provided within volume 1, chapter 4: Site Selection and Consideration of Alternatives and the Works Plan (onshore) (application document reference A2.4.2).

7. References

Department for Communities and Local Government (DCLG) (2015), The Planning Act 2008: Guidance on Changed to Development Consent Orders. Available online: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/485064/Making_changes_guidance_to_Development_Consent_Orders.pdf. [accessed 7 February 2017].