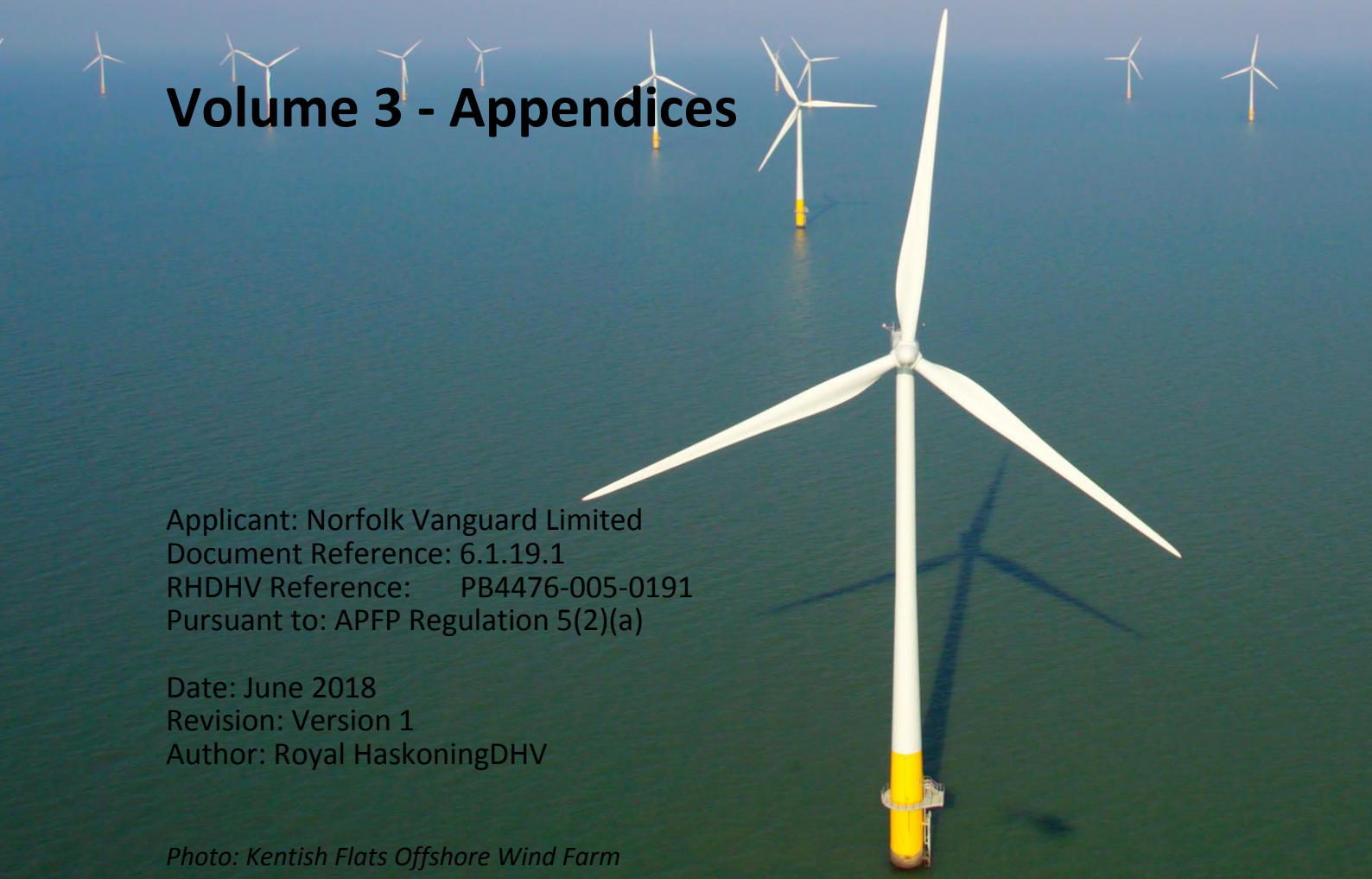
Norfolk Vanguard Offshore Wind Farm

Appendix 19.1

Land Quality Phase 1 Preliminary Risk Assessment

Environmental Statement

Volume 3 - Appendices



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Environmental Impact Assessment
Environmental Statement

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For and on behalf of Norfolk Vanguard Limited

Approved by: Ruari Lean, Rebecca Sherwood

Signed: [redacted]

Date: 8th June 2018

For and on behalf of Royal HaskoningDHV

Drafted by: Maria Walentek / Ian Dennis

Approved by: Amy Harrower

[redacted]

Signed:

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Glossary

BGS	British Geological Survey
CDM	Construction, Design and Management
CIRIA	Construction Industry Research and Information Association
CSM	Conceptual Site Model
EMP	Environmental Management Plan
HDD	Horizontal Directional Drilling
LNR	Local Nature Reserve
MMP	Materials Management Plan
MTBE	Methyl Tert-Butyl Ether
NGR	National Grid Reference
OS	Ordnance Survey
PAH	Polyaromatic Hydrocarbons
PCB	polychlorinated biphenyls
PCOC	Potential contaminants of concern
PEIR	Preliminary Environmental Information Report
PHE	Public Health England
PPE	Personal Protective Equipment
PPG	Pollution Prevention Guidance
PRA	Preliminary Risk Assessment
RPE	Respiratory Protective Equipment
SAC	Special Area of Conservation
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SVOC	Semi-volatile Organic Compounds
VOC	Volatile Organic Compounds

Terminology

Bq m^{-3}	Becquerel
Landfall	Where the offshore cables come ashore at Happisburgh South
National Grid substation extension	The permanent footprint of the National Grid substation extension
Necton National Grid substation	The existing 400kV substation at Necton, which will be the grid connection location for Norfolk Vanguard
Onshore cable corridor	200m wide onshore corridor within which the onshore cable route would be located as submitted for PEIR.
Onshore cable route	The 45m easement which will contain the buried export cables as well as the temporary running track, topsoil storage and excavated material during construction.
Onshore project area	All onshore electrical infrastructure (landfall; onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas; onshore project substation and extension to the Necton National Grid substation and overhead line modification)
Onshore project substation	A compound containing electrical equipment to enable connection to the

	National Grid. The substation will convert the exported power from HVDC to HVAC, to 400kV (grid voltage). This also contains equipment to help maintain stable grid voltage.
The project	Norfolk Vanguard Offshore Wind Farm, including the onshore and offshore infrastructure

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19 LAND QUALITY PHASE 1 PRELIMINARY RISK ASSESSMENT

19.1 Introduction

19.1.1 Scope

1. Royal HaskoningDHV has been commissioned by Norfolk Vanguard Limited to carry out a Phase 1 Land Quality Preliminary Risk Assessment (PRA) in support of the Environmental Statement (ES) for the onshore project area and infrastructure associated with the Norfolk Vanguard Offshore Wind Farm Project (herein 'the project').

19.1.2 Norfolk Vanguard

2. The project would consist of between 90 and 257 wind turbines, each having a rated capacity of between 7 and 20MW, with a total installed capacity of up to 1,800MW.

3. The ES for the project comprises all offshore and onshore infrastructure associated with the project, including extensions to the existing Necton National Grid substation and laying of cable ducts for Norfolk Boreas within the onshore cable route.

4. A detailed description of the project can be found in Chapter 5 Project Description.

19.1.3 Key Objectives

5. The objectives of the PRA are, in the context of this project, to:

- Identify (as far as reasonably possible) any potential sources of contamination within the study area that may represent an unacceptable risk to construction workers, site users and/or the environment; and
- Conclude whether further investigation or assessment is needed to understand and mitigate the identified risks.

19.1.4 Methodology

6. The PRA has been completed in general accordance with the approach recommended in Contaminated Land Report 11 (Defra and Environment Agency, 2004).

7. The PRA is a desk-based study and forms the initial step in the assessment of potentially contaminated land. It proceeds, if required, intrusive investigation, risk assessment, options appraisal, remedial design, implementation planning and completion reporting.

8. The main purpose of the PRA is to identify whether there are potentially unacceptable risks to human health or the environment posed by the site and the immediate surroundings, which warrant further investigation.

9. The following desk-based information sources have been reviewed:

- Envirocheck Report compromising identified potential contaminative land uses from historical maps, environmental sensitivity data and permitting records.
- British Geological Survey (BGS) Onshore GeoIndex web portal.
- Environment Agency 'What's in my Backyard' web portal.

10. A site walkover survey of the survey area (as defined in section 19.1.5) was also undertaken concurrently with the Phase 1 habitat survey to verify current conditions in February 2017 and submitted as part of the consultation on the project for the Preliminary Environmental Information Report (PEIR) (December, 2017).

19.1.5 Survey Area

11. The survey area for the PRA is based on the onshore project area at time of writing (May 2017) which comprises the following search areas:

- Landfall search zones;
- Cable Relay Station search zones;
- Onshore project substation search zone;
- National Grid substation extension zone; and
- Onshore cable corridor.

12. It should be noted that the onshore project area has been further refined since this assessment was undertaken, for the ES to be submitted with the DCO application in June 2018. The data collected and presented as part of this assessment for the PEIR is still considered to be valid as it covers a wider area that has since been refined.

13. Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project, and refines the onshore cable corridor from 200m as presented in the PEIR to a 45m onshore cable route, however the data and assessment covering this area has remained for completeness.

14. The survey area consists of the onshore project area at the time of original drafting plus a 250m buffer and is shown on Figure 19.1.

19.1.6 Project Description

15. The onshore project area as detailed in Chapter 5 Project Description, includes the following elements:

- Landfall;
- Onshore cable route, accesses, trenchless crossing technique (e.g. Horizontal Directional Drilling (HDD)) zones and mobilisation areas;
- Onshore project substation; and
- Extension to the Necton National Grid substation and overhead line modifications.

19.1.7 Report Format

16. This report presents the findings of the PRA and compromises the following principal sections:

- Section 19.2: Site Location and Land Use;
- Section 19.3: Environmental Setting;
- Section 19.4: Preliminary Conceptual Site Model;
- Section 19.5: Conclusions; and
- Section 19.6: Recommendations and Next Steps.

19.2 Site Location and Land Use

19.2.1 Current Land Use

17. The coastal area is developed and notably includes the industrial Bacton Gas Terminal site, however the majority of the survey area is agricultural.

18. Settlements within the survey area include the towns of North Walsham, Dereham and Reepham, and both roads and railway lines cross though this area.

19. No major contamination sources were identified during the walkover, with the exception of the fly tipping area (TF884098) in the onshore project substation search zone.

20. A detailed description of the current land use can be found in Chapter 21 Land Use and Agriculture.

19.2.2 Historical Land Use

21. The site history was established from a review of historical maps dating from 1890 to 2017. It must be noted that this is a broad-scale review of the search area to determine its history with respect to potential contaminative use. Only information relevant to land quality has been used in the completion of this PRA. A summary of

identified land uses which are considered relevant to the PRA is provided in Table 19.1 and presented on Figure 19.1.

Table 19.1 Summary of historical map information relating to land within and surrounding the study area (items in bold are within with the survey area)

Historical map dates	Land use	Location
Onshore cable corridor		
1887	Cemetery or Graveyard	100m north (National Grid Reference (NGR) TG331315)
1889	Quarrying of sand & clay, operation of sand & gravel pits	200m east (NGR TG127241)
1890	**Cemetery or Graveyard**	**Intersects (NGR TG285315)**
1890	Quarrying of sand & clay, operation of sand & gravel pits	150m south (NGR TG274315)
1890-1983	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG275317)**
1891	Cemetery or Graveyard	150m south-east (NGR TF917091)
1891	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TF902114)**
1891	**Quarrying of sand & clay, operation of sand & gravel pits**	**Intersects (NGR TG072212)**
1891	Quarrying of sand & clay, operation of sand & gravel pits	100m east (NGR TG061189)
1891	Quarrying of sand & clay, operation of sand & gravel pits	10m east (NGR TG037167)
1892	Quarrying of sand & clay, operation of sand & gravel pits	100m east (NGR TF974149)
1892	Unknown Filled Ground (Pit, quarry etc)	150m west (NGR TG036176)
1892	Unknown Filled Ground (Pit, quarry etc)	200m west (NGR TG018158)
1907	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF940123)**
1907	**Clay bricks & tiles [manufacture]**	**Intersects (NGR TG243308)**
1907	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	10m west (NGR TF939124)
1907	Clay bricks & tiles [manufacture]	200m south (NGR TF984151)
1907	Cement, lime & plaster products [manufacture]	100m east (NGR TG060190)
1946	Quarrying of sand & clay, operation of sand & gravel pits	200m north (NGR TG330316)
1950	Railways	50m east
1951	Quarrying of sand & clay, operation of sand & gravel pits	30m east (NGR TG056182)
1952	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	250m west (NGR TG052203)

Historical map dates	Land use	Location
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF900101)**
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF993152)**
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF996153)**
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TG067205)**
1958	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	150m south (NGR TF902093)
1958	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	350m south-east (NGR TF918090)
1958	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	200m east (NGR TF942117)
1958	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	100m east (NGR TG064201)
1959	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF894095)**
1959	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	400m south (NGR TF891092)
1972	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG311328)**
1972	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG307317)**
1972	Gas manufacture & distribution	10m north (NGR TG215294)
1975	Electricity Industry Facilities	100m south (NGR TG105236)
1985	Potential tanks	200m south (NGR TG105236)
1978	Tanks	200m south east (NGR TG064200)
1982	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG048180)**
1982	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG053186)**
1982	Unknown Filled Ground (Pit, quarry etc.)	100m west (NGR TG056188)
1982	Unknown Filled Ground (Pit, quarry etc.)	200m west (NGR TG054190)
1982	Unknown Filled Ground (Pit, quarry etc)	50m east (NGR TG060189)
1982	Unknown Filled Ground (Pit, quarry etc)	50m east (NGR TG061199)
1983	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG098238)**
1983	Unknown Filled Ground (Pit, quarry etc.)	200m north (NGR TG075236)

Historical map dates	Land use	Location
1983	Unknown Filled Ground (Pit, quarry etc.)	50 east (NGR TG062200)
1984	Road haulage	50m south (NGR TG106236)
1984	Unknown Filled Ground (Pit, quarry etc.)	30m east (NGR TF981152)
1984	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TF987155)**
1984	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG134249)**
1984	Electricity production & distribution [ink large transformers]	200m south (NGR TG126241)
1984	Unknown Filled Ground (Pit, quarry etc.)	200m south (NGR TF983151)
1990	**Unknown Filled Ground (Pit, quarry etc.)**	**Intersects (NGR TG184278)**
1990	Sawmilling, planing & impregnation [i.e. treatment of timber]	200m north (NGR TG174279)
1990	Unknown Filled Ground (Pit, quarry etc.)	200m north (NGR TG221306)
Onshore project substation search zone		
1887	Quarrying of sand & clay, operation of sand & gravel pits	350m south-west (NGR TF877101)
1906	Clay bricks & tiles [manufacture]	100m north-west (NGR TF884109)
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF920109)**
1958	**Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)**	**Intersects (NGR TF919098)**
1958	Unknown Filled Ground (Pond, marsh, river, stream, dock etc.)	350m east (NGR TF923098)
1981	Petroleum Storage Facilities and Potential Tanks	350m south-west (NGR TF877101)
1981	Potential Tanks	350m south-west (NGR TF877100)
1984	Motor vehicles: maintenance & repair e.g. garages	350m south-west (NGR TF877101)
Landfall (Happisburgh South)		
1970	**Electrical Sub Station Facilities**	**Intersects (NGR TG386307**
1970	**Tanks**	**Intersects (NGR TG386307**
1972	**Electricity production & distribution [inc large transformers]**	**Intersects (NGR TG386307)**

22. Note that historical Ordnance Survey (OS) mapping often contains omissions for national security purposes. The east of England has been heavily used for military

installations (such as airfields) which are often missing from the historical OS maps (see Chapter 28 Onshore Archaeology and Cultural Heritage for further information).

19.3 Environmental Setting

19.3.1 Permitting and Industrial Land Use

19.3.1.1 Discharge consents

23. The following discharge consents have been identified:

- There are no discharge consents within the onshore project substation search zone;
- There are five discharge consents within the onshore cable corridor. These are associated with sewage discharges or unknown discharges;
- There are six discharge consents located in the Happisburgh South landfall zone associated with sewage discharges and unknown discharges. ; and
- There are 131 discharge consents within 250m of the survey area.

24. These are shown in Figure 19.2.

19.3.1.2 Pollution incidents

25. There was only one minor pollution incident within the onshore cable corridor. This occurred in 1993. According to the Environment Agency, the pollution incident was associated with miscellaneous pollutants. There have been no other recorded pollution incidents within the survey area. However, there has been a number of pollution incidences recorded within 250m of the survey area. These are all presented on Figure 19.2.

19.3.1.3 Waste management sites

26. No waste management facilities or areas of current or historical landfilling have been identified within the survey area. Waste management facilities and areas of landfilling (current and historical) within 250m of the survey area are shown in Table 19.2 and presented on Figure 19.2.

Table 19.2 Waste management facilities within 250m of the survey area

Description	Location
Scrapyard - No known restriction on source of waste	200m south
Licensed Waste Facility	200m south
Household, Commercial and Industrial transfer stations	250m south
Recorded Landfill Site - Cesspool Disposal Tip (closed)	60m south
Historic Landfill. Deposited Waste included Liquid Sludge	20m south

19.3.1.4 Contemporary trade activities

27. There are no contemporary trade entries within the survey area. There are 97 contemporary trade entries within 250m of the survey area (Figure 19.2). These are operational businesses which may include potentially contaminative activities. These include:

- Electronic component manufacture & distribution;
- Machine shop;
- Car body repairs;
- Clothing and fabric manufacture;
- Mechanical engineers;
- Car breakers and dismantlers;
- Oil and gas extraction (Bacton Gas Terminal area);
- Screen processes;
- Bus and coach operators and stations;
- Scrap metal merchants;
- Brewers;
- Medical equipment manufacture;
- Road haulage services;
- Garage services;
- Waste disposal services;
- Commercial cleaning services;
- Car dealers;
- Petrol filling station;
- Pest & vermin control;
- Recycling centre;
- Spraying – paint and coatings; and
- Gunsmith.

19.3.2 Environmental Setting

19.3.2.1 Geological conditions

28. The geological conditions at the survey area have been collated from the Envirocheck report and the BGS online viewer. The indicated geological sequence is outlined in Table 19.3 and presented on Figure 19.3.

Table 19.3 Geology

Stratum	Unit Name	Description
Superficial Deposits	Till - Diamicton	Variable lithology, usually sandy, silty clay with pebbles, but can contain gravel-rich, or laminated sand layers; varied colour and consistency.

Stratum	Unit Name	Description
	Glacial Sand and Gravel	Sand and gravel with rare clay interbeds; often cross-bedded; of glacial origin.
	Alluvium	Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel.
Bedrock	Crag	Neogene And Quaternary Rocks (undifferentiated) - Gravel, Sand, Silt and Clay.
	White Chalk	Chalk with flints. With discrete marl seams, nodular chalk, sponge-rich and flint seams throughout.

19.3.2.2 Mining and mineral extraction

29. The site is not located in an area that might be affected by coal mining activity.

30. The onshore project area contains significant sand and gravel resources, associated with the glaciofluvial deposits. A Mineral Safeguarding Area is an area designated by the Mineral Planning Authority to protect known deposits of mineral resources from unnecessary sterilisation by non-mineral development. The onshore cable corridor crosses several Mineral Safeguard Areas, as shown on Figure 19.4.

31. There are 31 mineral sites recorded by the BGS within the survey area. They consist of sites that were formerly used for the extraction of common clay, shale, gravel and sand, and all have now ceased operations.

32. The presence of these mineral workings is only likely to impact on the risk from contaminants where the workings have been subsequently backfilled. The impact of the proposed project on the mineral resources of the area is discussed in Chapter 19 Ground Conditions and Contamination.

19.3.2.3 Radon gas

33. The presence of radon gas is assessed in the UK according to the number of homes likely to be above the Action Level (200 becquerels per cubic metre (Bq m^{-3})). Under building regulations the requirement for protection measures (described in BRE, 2015) in the construction of new buildings, conversions or extensions is dependent on Radon Potential.

34. The Radon Potential dataset is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland, created jointly by Public Health England (PHE) and the BGS using long-term radon measurements made in over 479 000 homes across Great Britain and 23,000 homes across Northern Ireland (without affecting householders' confidentiality), combined with geological map data.

35. PHE recommends that radon levels should be reduced in homes where the annual average is at or above 200Bq m^{-3}. This is termed the Radon Action Level.

36. BGS data indicate that the survey area is located within a lower probability radon area (less than 1% of homes above the Action Level) therefore no protective measures are required.

19.3.2.4 Groundwater

19.3.2.4.1 Hydrogeology

37. Hydrogeological information has been collated from the Envirocheck data. Superficial and bedrock strata are classified by the Environment Agency according to their resource value and vulnerability as shown in Table 19.4 and shown on Figure 19.5.

38. The Environment Agency's groundwater vulnerability maps indicate the survey area is located within an area of high groundwater vulnerability (overlying a permeable aquifer). This indicates soils which may be able to transmit a wide range of pollutants into any groundwater stored in strata beneath them. This designation is based on limited information and so a worst case groundwater vulnerability classification is assigned. However, the superficial deposits classified as unproductive strata and are likely to minimise the flow of contamination and therefore provide a degree of protection to underlying water resources.

Table 19.4 Environment Agency groundwater classifications

Criteria	Location	Class	Class
Aquifer Classification	Superficial Deposits	Secondary Aquifer - Undifferentiated	*Principal* aquifers are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. *Secondary A* aquifers contain permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. *Secondary B* aquifers may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. *Secondary Undifferentiated* aquifers have not been categorised as A or B due to their variable characteristics.
		Secondary Aquifer - A	
		Secondary Aquifer - B	
		Unproductive Strata	
	Bedrock	Principal (chalk)	

39. BGS flood risk information indicates that most of the survey area is located within areas with limited potential for groundwater flooding. However there are some areas with potential for groundwater flooding at the surface and of property situated below ground level within the survey area. These are located in the area of Scarning,

Bushy Common, Dillington, Wensum River, Cawston, River Bure, North Walsham, Walcott, Witton and Fox Hill, as shown on Figure 19.6.

19.3.2.5 Groundwater abstractions

40. There are a number of licenced groundwater abstractions within the survey area.

41. Note that the data search has not included identification of unlicensed water supplies withdrawing less than $20m^3$ water per day.

19.3.2.6 Groundwater Source Protection Zones

42. Groundwater Source Protection Zones (SPZs) are defined around abstraction boreholes used for potable water supply, to delineate the area where release of a contaminant into the aquifer could impact on the abstraction. There are three types of SPZ:

- The Inner Zone (Zone 1) is the most sensitive and certain some activities with potential to pollute groundwater are restricted in this area;
- The Outer Zone (Zone 2) is less sensitive, and there are fewer restrictions; and
- Outside Zone 2 is the Total Catchment (Zone 3), which indicates the recharge area that contributes to that water supply.

43. The Environment Agency has published SPZs for public water supplies and other significant sources. For potable abstractions without published SPZs there is a default Inner Zone of 50m radius and, an Outer Zone of 250m or 500m radius (depending on the size of the abstraction).

44. The National Grid substation extension zone is located within SPZ Zone 3. The onshore cable corridor would cross several SPZ as shown on Figure 19.5.

19.3.3 **Surface Water**

19.3.3.1 Hydrology and drainage

45. The project is located within four main surface water catchments:

- The River Bure and several of its tributaries (most notably King's Beck) would be crossed by the proposed cable route. The river rises near Briston, from where it flows in an easterly direction until it reaches Aylsham. From here, it continues to flow to the south east until it enters the sea at Great Yarmouth. The downstream reaches of the river include a wide range of wetland features, including Hoveton Great broad and Marshes, Woodbastwick Fens and Marshes, Bure Marshes and the Norfolk Broads.
- The River Wensum and several of its tributaries (most notably Wendling Beck and the Blackwater Drain) would be crossed by the onshore cable corridor. The river rises near Whissonsett, from where it flows north towards Fakenham before continuing in a broadly south easterly direction towards Norwich.

- The River Wissey, the headwaters of which would include the proposed grid connection at the Necton National Grid substation. The Wissey rises to the south of Dereham, from where it drains in a westerly direction towards Necton before eventually joining the River Great Ouse at Denver Sluice, near Downham Market.
- The North Walsham and Dilham Canal would be crossed by the onshore cable corridor at North Walsham. The canal commences at Antingham, from where it flows in an easterly direction towards Swafield. The canal is joined by several natural watercourses, including Fox's Beck. The watercourse then continues south-east through North Walsham, to Wayford Bridge, near Dilham, where it joins the tidal River Ant. The River Ant continues to flow in a southerly direction until it joins the River Bure at Horning.

19.3.3.2 Surface water abstractions

46. There are no licenced surface water abstractions within the survey area.

47. Note that the data search has not included identification of unlicensed water supplies withdrawing less than 20m^3 water per day.

19.3.4 Sensitive Land Use

48. There are four environmentally Sensitive Areas located within the survey area:

- River Wensum Site of Special Scientific Interest (SSSI);
- Happisburgh Cliffs SSSI;
- River Wensum Special Area of Conservation (SAC); and
- Pigney's Wood Local Nature Reserve (LNR).

19.4 Preliminary Conceptual Site Model and Qualitative Risk Assessment

19.4.1 Conceptual Site Model

19.4.1.1 Preliminary conceptual site model terminology

49. For contamination within soil or water to pose a risk, a pollutant linkage must be established. A pollutant linkage consists of three parts:

- A source of contamination in or on the land;
- A pathway by which the contaminant can cause harm (or which presents a significant possibility of such harm being caused); and
- A receptor that is sensitive to impact from the contamination.

50. Where all three of these parts are present, a pollutant linkage exists. Current guidance recommends that a Conceptual Site Model (CSM) is formulated based on the information available. As more information becomes available the conceptual model may be updated. The CSM is limited at this stage to the identification and

assessment of potential sources, potential receptors, and the anticipated pathways to those receptors identified as result of the documentary research.

19.4.1.2 Potential sources of ground contamination

51. Contamination sources can include neighbouring land uses and historical activities within the survey area and in its surrounding. From the desk based information and the findings of the site walkover, potential sources of contamination within the survey area are considered to be:

- Agricultural land can be associated with some contaminative activities including use/storage of pesticides and herbicides and burial of wastes (including asbestos);
- The dismantled railway lines south east Themelthorpe, south east of Oulton, are largely Made Ground and have the potential to contain elevated concentrations of contaminants such as petroleum and diesel hydrocarbons, heavy metals and polyaromatic hydrocarbons (PAHs);
- A number of historical common clay and shale pits and sand and gravel pits present in various locations within the survey area have been infilled, and may contain unknown and potentially contaminated fill material;
- Historical clay bricks and tiles manufactures north and north east of North Walsham, which could be associated with heavy metals (e.g. hexavalent chromium) and inorganic compounds (arsenic compounds);
- Graveyard north of North Walsham, which may be source of contaminants, such as metals, nutrients and pathogens; and
- Historic tanks in Happisburgh, which may be associated with very wide range of contaminants including hydrocarbons and other organic compounds like PCBs. It is understood that these are connected with the lighthouse.

52. The following potential sources of contamination within 250m of the survey area have been identified:

- Bacton Gas Terminal, which is associated with very wide range of contaminants including hydrocarbons and other organic compounds such as polychlorinated biphenyls (PCBs). There are a number of discharge / hazardous substance consents, and one minor pollution incident is associated with this site;
- Road haulage centre north of Reepham, which might be associated with hydrocarbons, Volatile Organic Compounds (VOCs) such as Methyl Tert-Butyl Ether (MTBE) and chlorinated hydrocarbons, Semi Volatile Organic Compounds (SVOCs), heavy metals (zinc, copper, chromium and lead) and Polycyclic Aromatic Hydrocarbons (PAHs);
- Electricity Industry Facilities north of Reepham; associated with very wide range of contaminants including hydrocarbons and other organic compounds such as PCBs;

- Timber treatment works in Silvergate, which may be associated with contaminants such heavy metals, inorganic elements and compounds such as chlorates and sulphates and PAHs;
- Petroleum Storage Facilities near Walcott, which may be associated with a very wide range of contaminants including hydrocarbons and other organic compounds such as PCBs; and
- Historical landfill south west of Witton may be associated with a very wide range of contaminants, including VOCs, SVOCs, heavy metals, cyanides, ammonium, chlorides, sulphates and PAHs.

19.4.1.3 Identified receptors

53. Based on the current and proposed use of the site, it is considered that the likely receptors will be:

- Future end users of the site during operational phase of the project when land is largely returned to its former use (farm workers) through dermal contact, ingestion and inhalation (with the exception of the substation site, the end use of the land will not change as a result of the development);
- Construction and maintenance personnel involved in excavation (e.g. cable installation, substation construction and reinstatement of services) through dermal contact, ingestion and inhalation;
- Shallow groundwater (Secondary A or B aquifers where present), the quality of the water may be affected by the leaching and disturbance of soil borne contaminants;
- Deep groundwater (Principal aquifer) is present beneath superficial deposits beneath the survey area. It might be affected by direct disturbance or leaching and groundwater migration where connectivity to the localised shallow aquifers exists;
- Surface freshwater bodies (various rivers, streams, ditches, ponds, lakes and a canal) through leaching of any soil borne contaminants, inflow of contaminated groundwater or direct entry by runoff; and
- The Environmentally Sensitive Areas Sites, for example River Wensum SSSI and SAC, through leaching, groundwater inflow or runoff.

19.4.2 Qualitative Risk Assessment

Table 19.5 Preliminary Conceptual Site Model and Qualitative Risk Assessment

Land Use	Pathway	Receptor	Qualitative Assessment Discussion of Pollutant Linkage & Risk Management
Sources within the survey area			
Made Ground and infill material. Historical Works and tanks. Dismantled railway line. Agricultural land. Graveyard.	Dermal Exposure, Inhalation, Ingestion	Human Health (Construction Workers)	Made Ground may be encountered within the survey area in areas such as former pits, historical works or dismantled railways. Further investigation should be conducted to ensure the nature of the material is understood prior to construction. The majority of the survey area crosses agricultural land, where significant contamination is not expected. There is a small risk of encountering buried asbestos or agrochemical waste. Where contaminated materials are encountered these should be segregated and assessed for their suitability for re-use or disposal off site. Where practical, trenchless crossing techniques (e.g. Horizontal Directional Drilling (HDD)) could be used to avoid significantly contaminated areas. Short term exposure will be mitigated by the use of appropriate personal protective equipment and appropriate methods of working. **Potential contaminants of concern (PCOC) could be present in the survey area and could represent an unacceptable risk to construction workers. However, it is likely that short term risks associated with construction could be managed through the use of personal protective equipment and appropriate working practices.**
	Leaching, Groundwater migration	Principal, Secondary A Aquifer Secondary Undifferentiated	Land within survey area is largely in agricultural use. Significant leachable contamination is not anticipated. Where encountered made ground materials should be assessed for their suitability prior to re-use. Land within survey area is largely in agricultural use. Significant leachable contamination is not anticipated.

Land Use	Pathway	Receptor	Qualitative Assessment Discussion of Pollutant Linkage & Risk Management
		Aquifer	The underlying geology comprises mainly of sands and gravels, which are highly permeable materials The Secondary aquifers are considered to be linked to the underlying Principal aquifer. There is the potential for contaminants of concern such as hydrocarbons and metals to leach from the Made Ground and migrate in groundwater and impact groundwater resources. Leaching/migration of contaminants can result in impacts to sensitive water resources. Several SPZs will be crossed by or lie adjacent to the survey area. The abstractions related to these zones are not considered to be at risk from the general cable construction works. However, where deeper trenchless crossing techniques (e.g. HDD) are to be undertaken the risk to the SPZs should be considered further. Trenchless crossing techniques (e.g. HDD) are proposed in Zone 3 in the area of Scarning, in Zones 1 and 2 north of Dereham and North Walsham, in Zone 3 under the River Wensum, in Zone 3 under the Cromer Road and in Zone 3 south of Edingthorpe (Figure 19.5). Investigation should be carried out to ensure there is a sufficient thickness of impermeable deposits to protect the underlying aquifer. Where the trenchless crossing techniques (e.g. HDD) exceed the depth of drift deposits, or comes close to the base, mitigation measures should be set in place to protect the aquifer, prevent the creation of a temporary or permanent pathway for groundwater migration (and prevent a pollution incident from the disturbance of sediments or accidental spillage or leakage of drilling fluids. This is discussed in Chapter19 Ground Conditions and Contamination. Some parts of the survey area are located in the area prone to fluvial flooding and with the potential for groundwater flooding. Flood events could potentially cause mobilisation of pollutants from the ground into surface waters. If any ad-hoc or unexpected contamination is encountered during trenching operations this should be further investigated. Protocols should be in place to ensure that unexpected contamination can be managed to prevent a pollution incident.

Land Use	Pathway	Receptor	Qualitative Assessment Discussion of Pollutant Linkage & Risk Management
			PCOC could therefore represent an unacceptable risk to controlled waters from leaching or groundwater transport.
		Surface waters	The presence of the Till in many locations throughout the survey area will significantly delay the potential migration of any contaminants encountered or disturbed. Watercourses crossed by the project may be in close connection with groundwater, and where this groundwater supports potable abstractions, contamination entering the watercourse may be drawn to the abstraction points. **PCOC could therefore represent an unacceptable risk to controlled waters from leaching or groundwater transport.**
	Direct Entry	Surface Waters/ Marine Environment	The survey area is largely comprised of agricultural land therefore significant areas of contamination are not expected. Appropriate control/mitigation measures should be put in place by the contractor during construction works to prevent migration of contaminated sediments to controlled waters. **The potential risk from this pollutant linkage is considered to be low.**
Sources within 250m of the survey area			
Agricultural land. Bacton oil terminal. Road haulage centre. Electricity Industry Facilities. Historic works. Petroleum Storage Facilities. Historic landfill.	Dermal Exposure, Inhalation, Ingestion	Human Health (Construction Workers)	Short term exposure, will be mitigated by the use of appropriate personal protective equipment and appropriate methods of working. Areas of localised potential contamination lie adjacent to the survey area as landfills, filled pits and oil terminals. There is the potential for contaminants within leachates or groundwater to migrate into the area of the cable corridor and therefore be encountered during construction works. **PCOC could be present in the survey area and could represent an unacceptable risk to construction workers. However, it is likely that short term risks associated with construction could be managed through the use of personal protective equipment and appropriate working practices**.

Land Use	Pathway	Receptor	Qualitative Assessment Discussion of Pollutant Linkage & Risk Management
	Gas migration through permeable strata	Human Health (Future Site Users)	There is the potential for gas generation and migration into the survey area within the permeable strata. Any confined spaces, manholes or pits should be constructed away from potential contamination risk areas to prevent the risk of maintenance contractors entering an area subject to potential gas build up. **The potential risk from this pollutant linkage is considered to be low.**

19.4.3 Uncertainties in the Conceptual Site Model

54. At this stage in the process there are a number of uncertainties associated with the preliminary conceptual site model, specifically associated with defining the potential sources and the respective pathways as summarised below:

- The presence, magnitude and extent of the PCOC needs to be established to determine risks to human health, controlled waters and property;
- The mobility of contaminants needs to be established to determine risks to controlled waters; and
- The geology and hydrogeological regime at the site needs to be established to determine the potential for contaminant migration, including ground gas.

19.5 Conclusions

55. A desk-based assessment of contamination risks has been undertaken for the project. A number of localised potential sources of contamination have been identified within or near the site. The potential risk posed by the off-site sources is only likely to be realised where the contamination sources co-exist with the more permeable Glaciofluvial Deposits. Therefore for the off-site sources, no further action would be required in areas where the potential sources and permeable strata do not co-exist.

56. Should the onshore cable corridor cross a zone of permeable material that co-exists with an area of potential contamination, there may be a risk of encountering impacted groundwater, or ground gas migration. Precautions should be taken to ensure that a further pathway for contaminant migration to controlled waters is not created and that the risk to future workers and construction workers is mitigated or managed by gas monitoring while working in confined spaces or siting jointing pits away from potential risk areas.

57. As part of the cable installation process, trenchless crossing techniques (e.g. HDD) would be required to allow trenchless installation across a number of features (e.g. highway infrastructure, larger watercourses, railway line, etc). Several trenchless crossing (e.g. HDD) locations will be conducted above SPZs. Trenchless crossings (e.g. HDD) works in these locations should ensure that a sufficient thickness of glacial material is present to prevent migration of contaminants into the protected Principal aquifer beneath.

19.6 Recommendations and Next Steps

58. Given the project design and the findings of the PRA, a number of recommendations have been made. These are detailed below.

19.6.1 Soil investigation

59. It is recommended that ground investigations and further assessment of potential Made Ground in the on-site source areas at dismantled railway lines and Bacton Gas Terminal is undertaken to establish the risk to construction and the suitability of soils for re-use.

60. It is recommended that the potential risk posed by the off-site sources is established. Further desk based assessment should be undertaken to establish the presence of this linkage. If this linkage is found to be present, an investigation to establish the risk to construction from leachates and gas migration would be recommended.

61. Protocols for dealing with unexpected contamination should be set in place prior to construction to ensure that procedures are known and agreed with the Regulators should contaminated materials be encountered.

62. Ground investigation and further assessment may be required in the areas of the HDDs where they cross SPZs to ensure that drilling will not disturb the SPZs for the Principal aquifer beneath.

19.6.2 Soil movement/ reuse on-site

63. In terms of managing the movement and reuse of materials, reference should be made to the CL:AIRE Code of Practice (CL:AIRE, 2011). *The definition of waste: Development Industry Code of Practice.* The code is aligned with CLR11 (Defra and Environment Agency, 2004) where land is either contaminated or suspected of being contaminated. It must be noted that there is no similar published framework available for cases where land is not suspected of being contaminated. The code does, however adopt a similar approach for the latter scenario, whereby a Design Statement is required (where a remediation strategy would otherwise be necessary).

64. Firstly, it must be determined whether the soils to be excavated on-site are a waste material or not. This depends on a range of factors set out in Environment Agency and CL:AIRE guidance, principally:

- Suitability of material for use (without any further treatment);
- Certainty of use within the design; and
- Quantity of material.

65. To demonstrate that the criteria have been satisfied, a Materials Management Plan (MMP) must be prepared, which will ultimately form part of a wider design statement. The MMP will include an auditable tracking system and make allowance for contingency arrangements, e.g. discovery of unexpected soil materials on-site.

66. If it is envisaged that the use of materials will occur in excess of one year from being stockpiled or stored on-site a time limit must be agreed with the Environment Agency. The decision relating to the length of storage will be made within the context of the extant planning permission or agreed programme of works. It is likely that supporting information will be requested by the Environment Agency. Such information may include site plans, cross sections and information regarding stockpile management issues, such as control of dust, suspended solids and runoff.

19.6.3 Waste disposal/ imported material

67. Any material excavated and requiring disposal off site will need to be characterised and disposed of in accordance with the Landfill Regulations 2002 (as amended) and the Hazardous Waste Regulations 2005, where applicable. Any material classified as hazardous waste will require pre-treatment prior to disposal to either reduce the volume of hazardous waste requiring disposal or to reduce the hazardous nature of the material.

68. Any soils imported to the site will need to be tested and verified to ensure that they do not pose a risk to human health or controlled waters and that they are suitable for their intended use. They will also need to be accompanied by all relevant Duty of Care documentation.

19.6.4 Construction health & safety

69. Risks to construction workers may be controlled though good site practice and hygiene in addition to the use of appropriate Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE), where necessary.

70. Method statements and risk assessments should be developed for all site works to aid identification of such risks and appropriate risk avoidance and reduction measures. The works should be undertaken in accordance with the requirements of the Construction (Design and Management) (CDM) Regulations 2015 where appropriate.

19.6.5 Pollution prevention

71. During the construction phase, contractors and designers should ensure that sound environmental practices are adopted and followed including relevant best practice guidance from the Environment Agency Pollution Prevention Guidance Note (PPG) series and construction best practice documents published by the Construction Industry Research and Information Association (CIRIA).

72. Care should be taken during construction to prevent uncontrolled run-off that may contain suspended solids or leaked fuels in order to mitigate pollution of adjacent surface waters. It is recommended that a site Environmental Management Plan

(EMP) is developed; this will include protocol for dealing with spillages and leaks of fuel and oils.

73. The storage of oils and fuels should be in a designated area, stored in bunds with 110% capacity, which will effectively capture any spills or leaks. Any temporary compounds should be located as far away from watercourses as possible.

74. Consideration should be given to the control and management of excavated sediments during any works in or around the various drains and dykes crossing the site. Control mechanisms and best practice should be detailed in an EMP for any works. Any excavated materials should be appropriately stored and segregated according to type to mitigate any potential pollution incidents.

19.6.6 Materials containing asbestos

75. Should any existing buildings or structures require removal as part of the project, a Type 3 pre-demolition asbestos survey should be carried out, in accordance with the Control of Asbestos Regulations 2012. If asbestos containing materials are identified, they should then be removed and disposed of in an appropriate manner and to the satisfaction of the Regulating Authority.

19.7 References

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19.8 Figures

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Happisburgh

Whimpwell Green

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Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map1 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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635000 636000 637000

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Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map2 of 25)

Figure: 19.6 Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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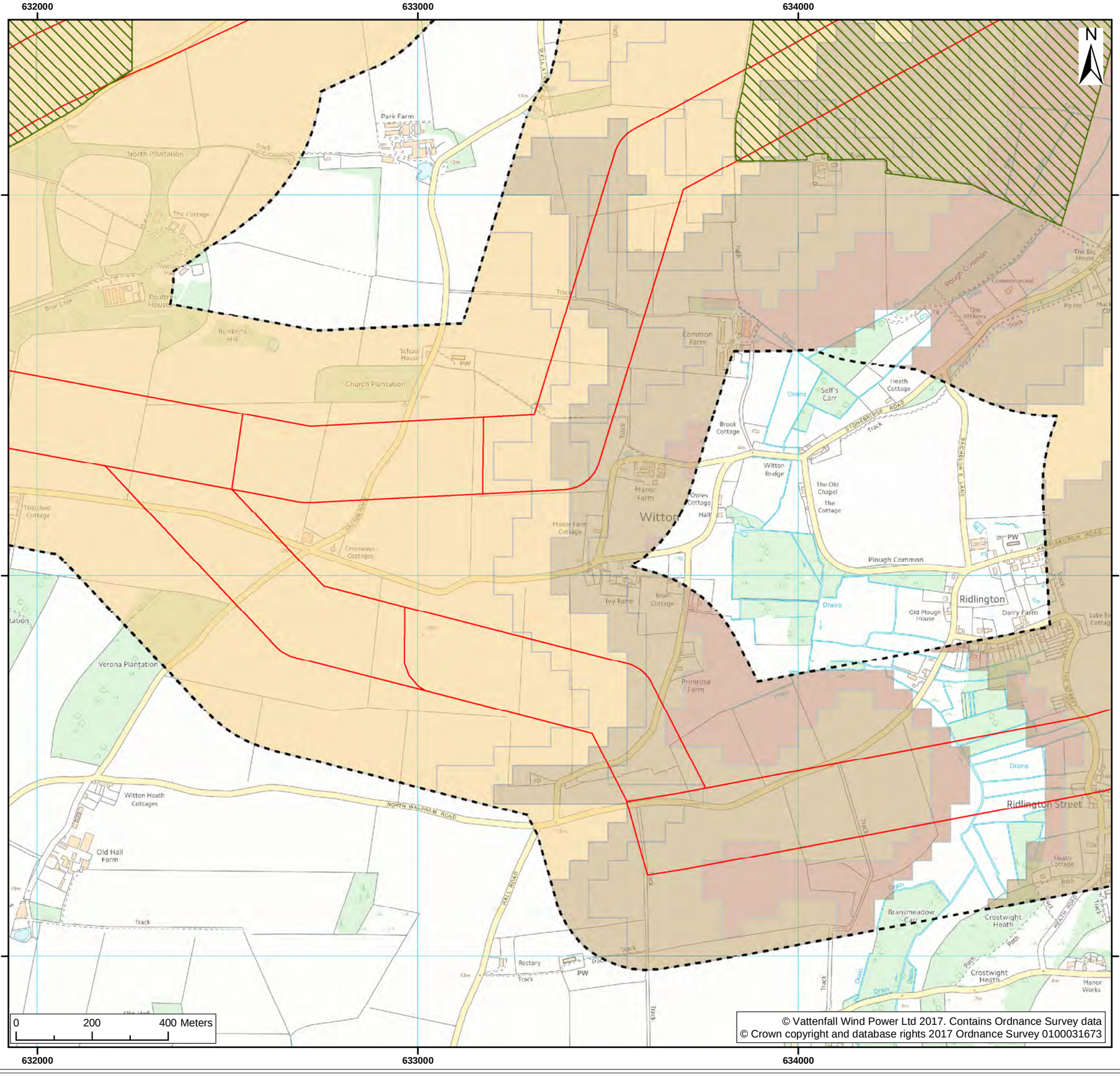

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map3 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map4 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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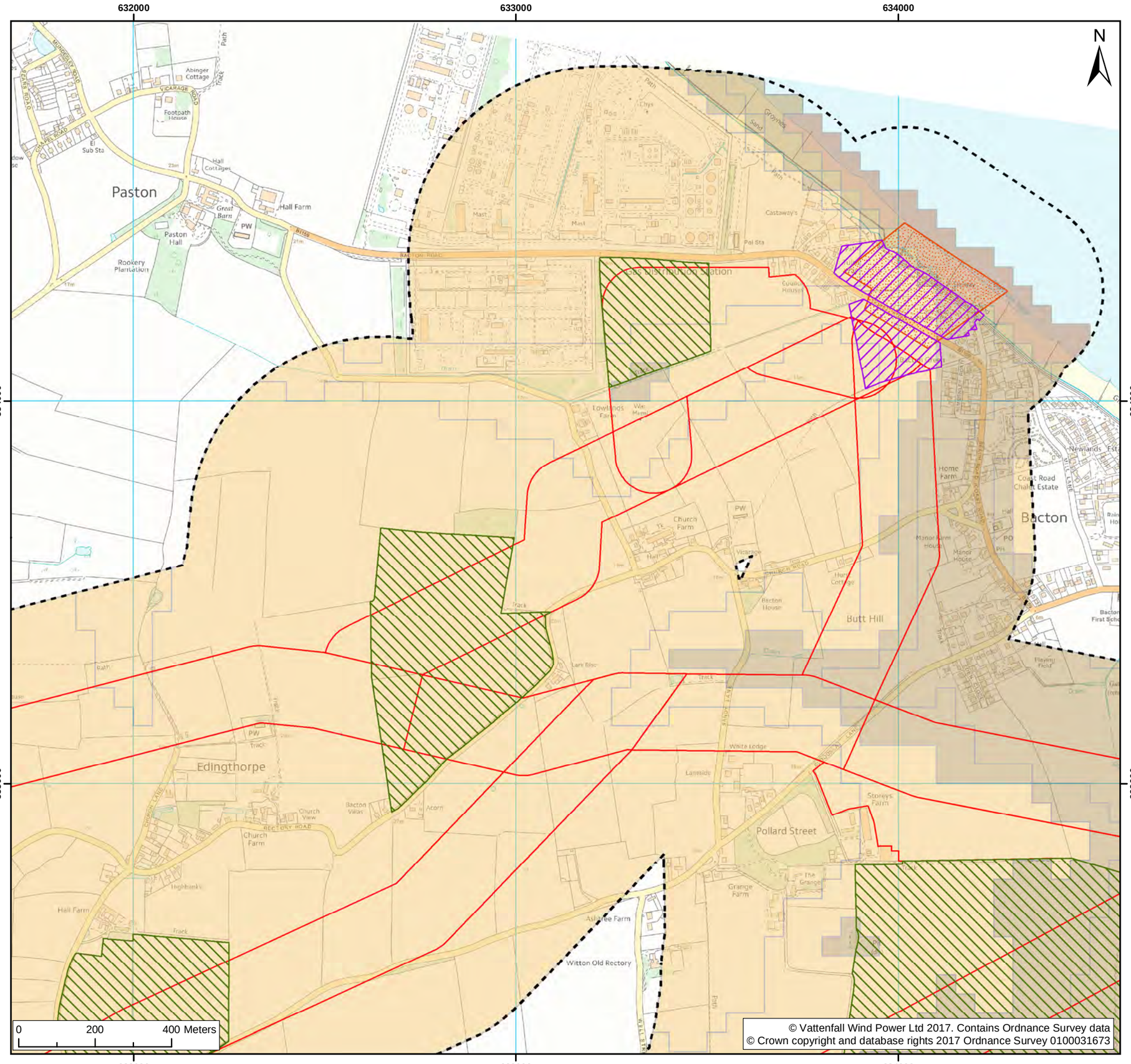

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map5 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

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Co-ordinate system: British National Grid **EPSG:** 27700

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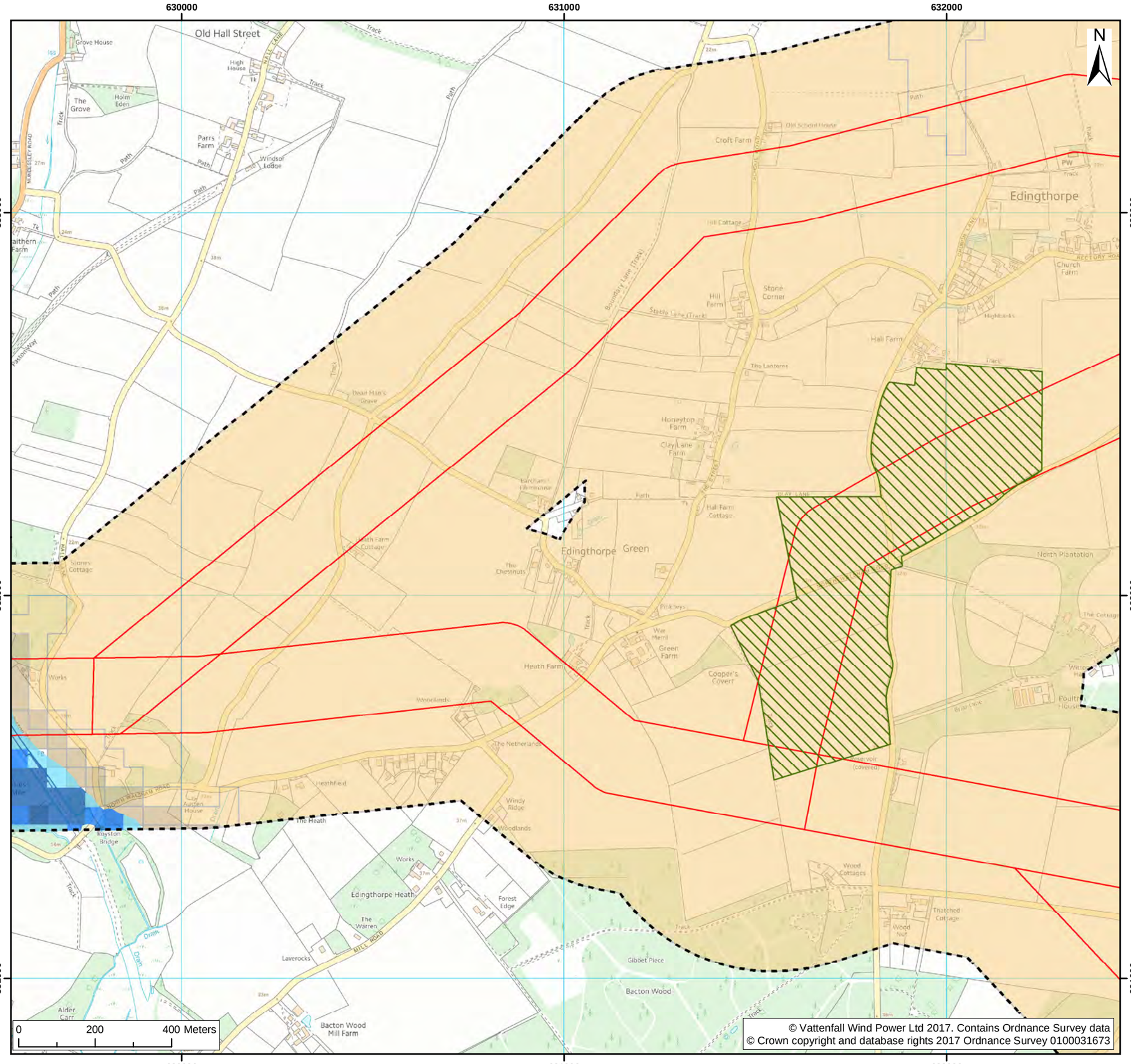

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map6 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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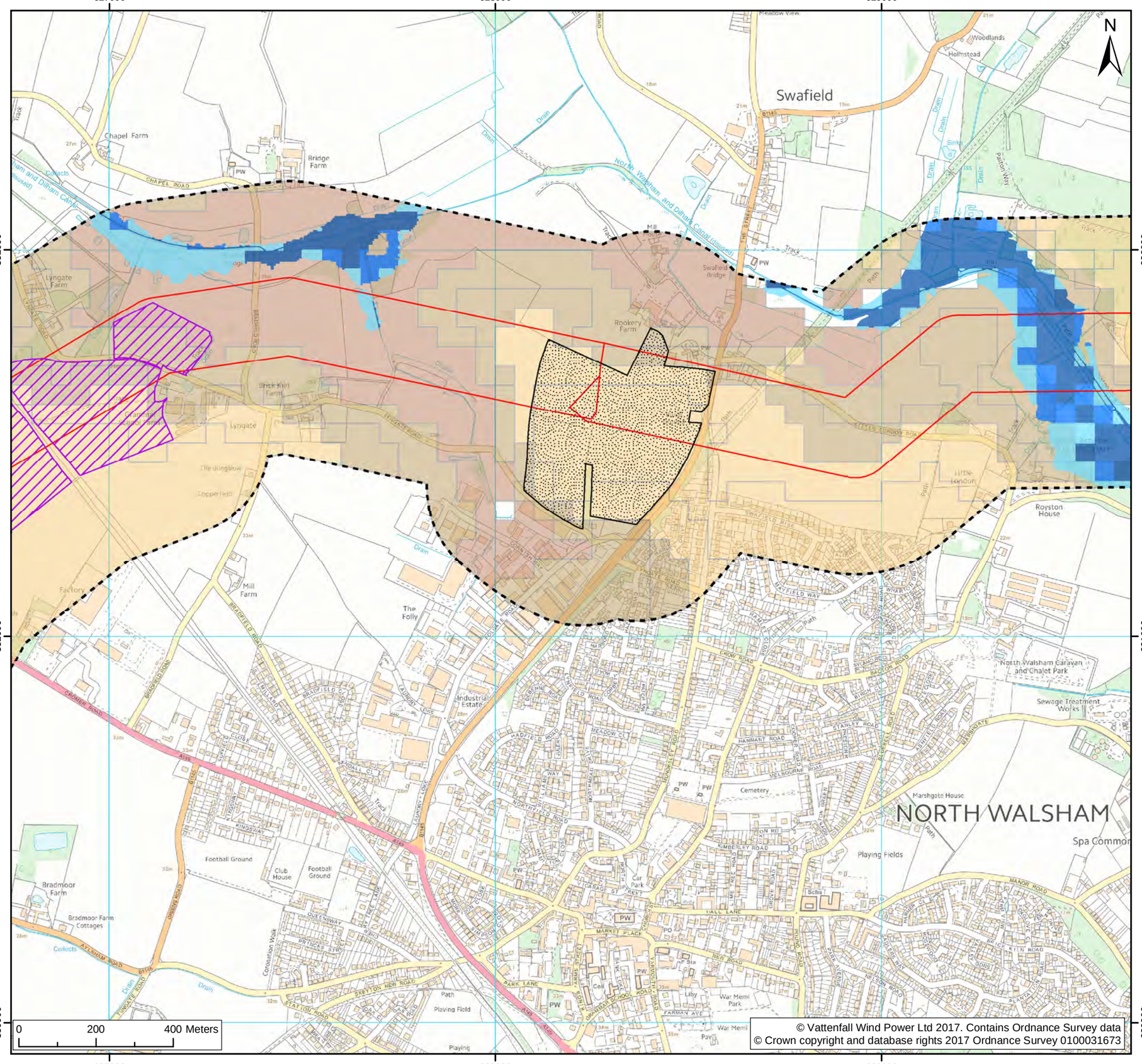

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map7 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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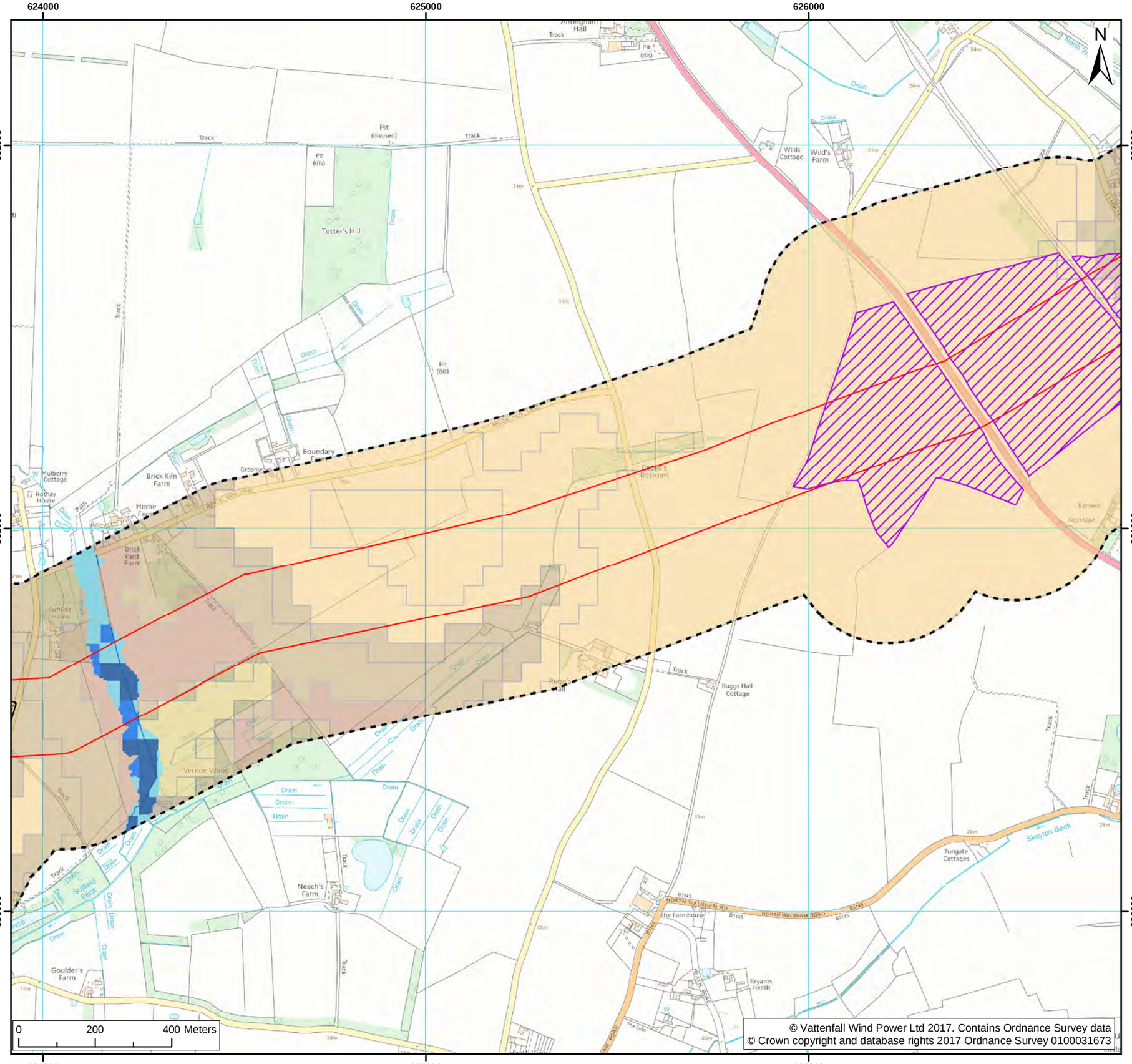

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map8 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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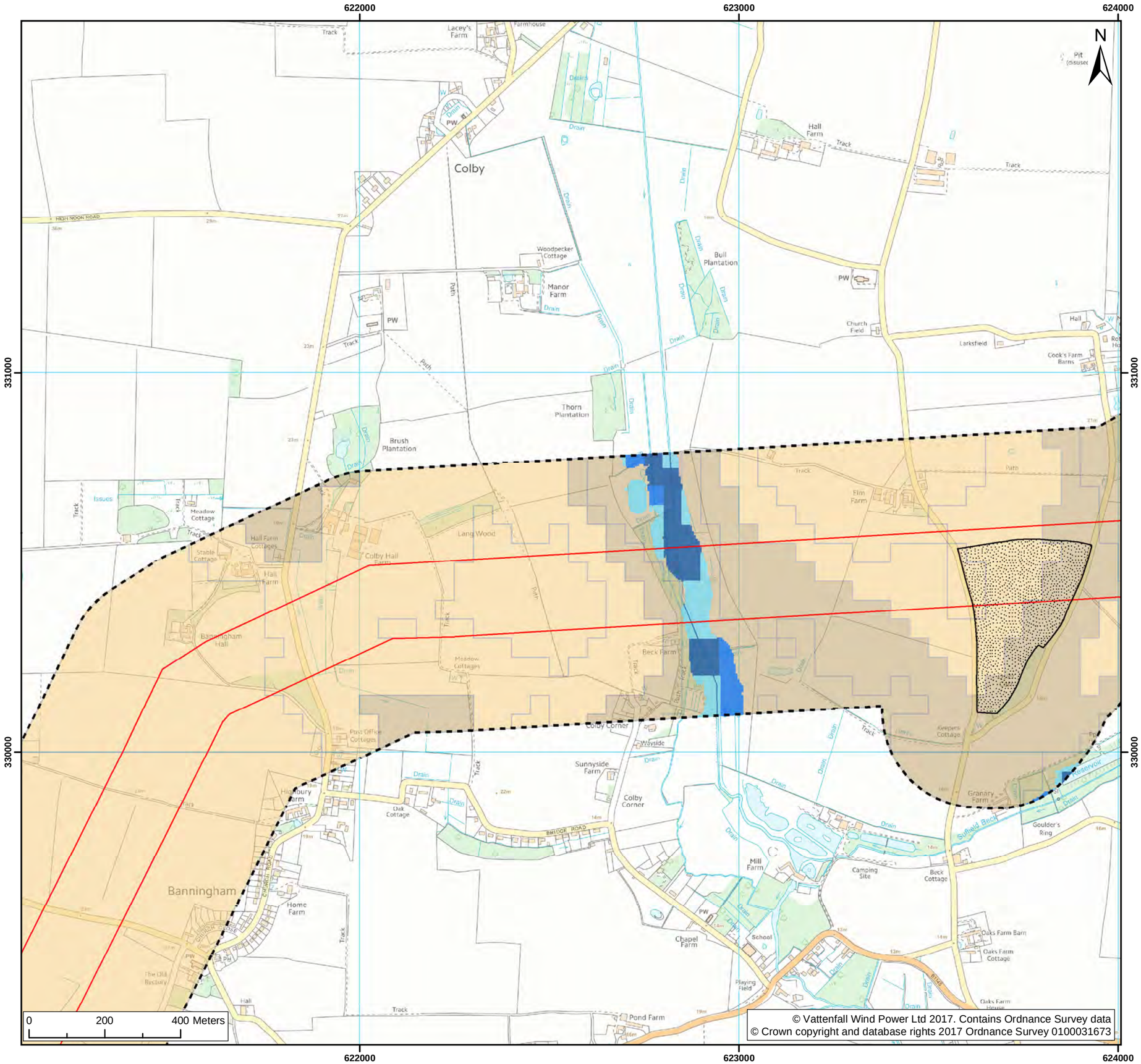

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map9 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

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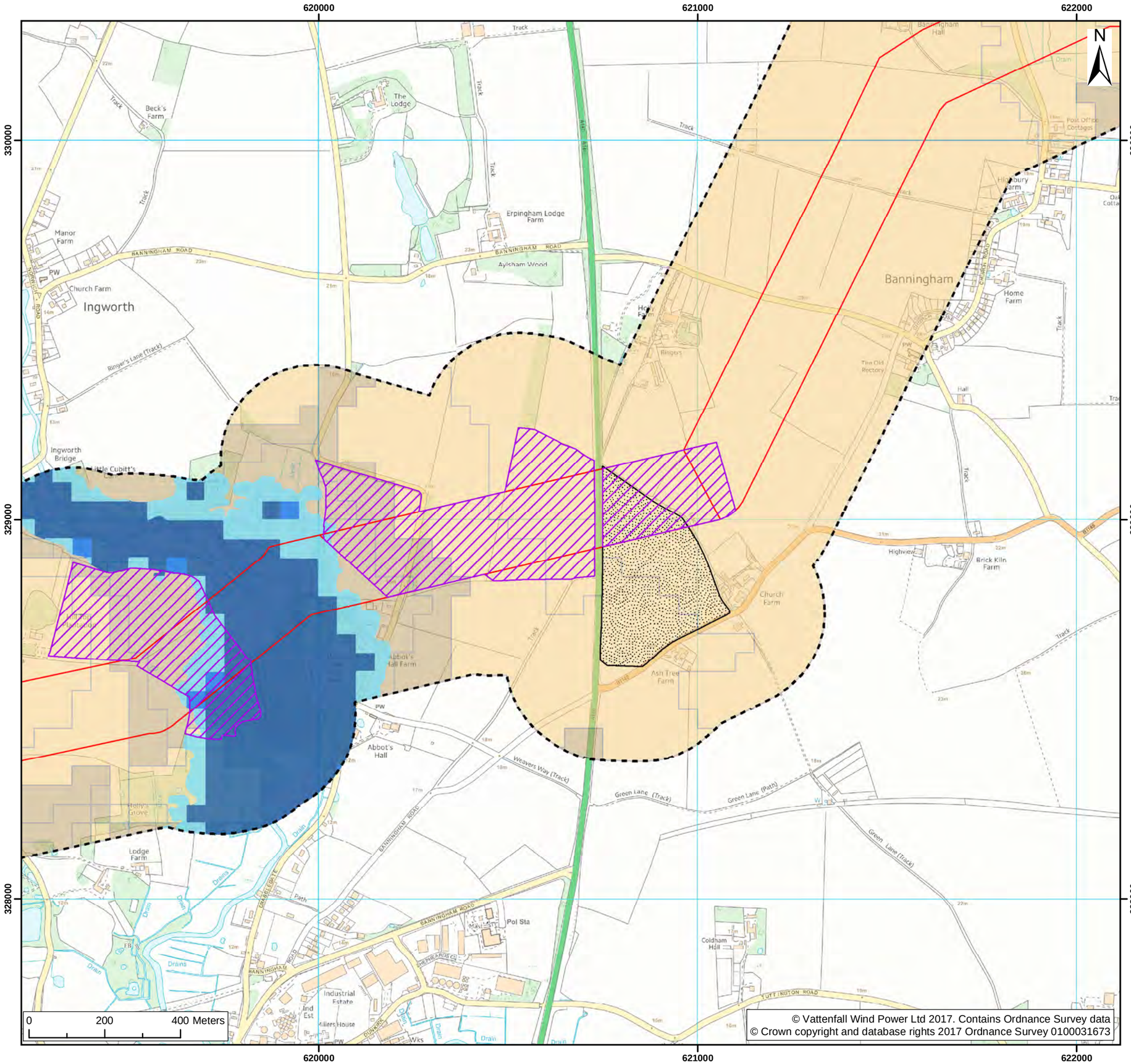

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map10 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

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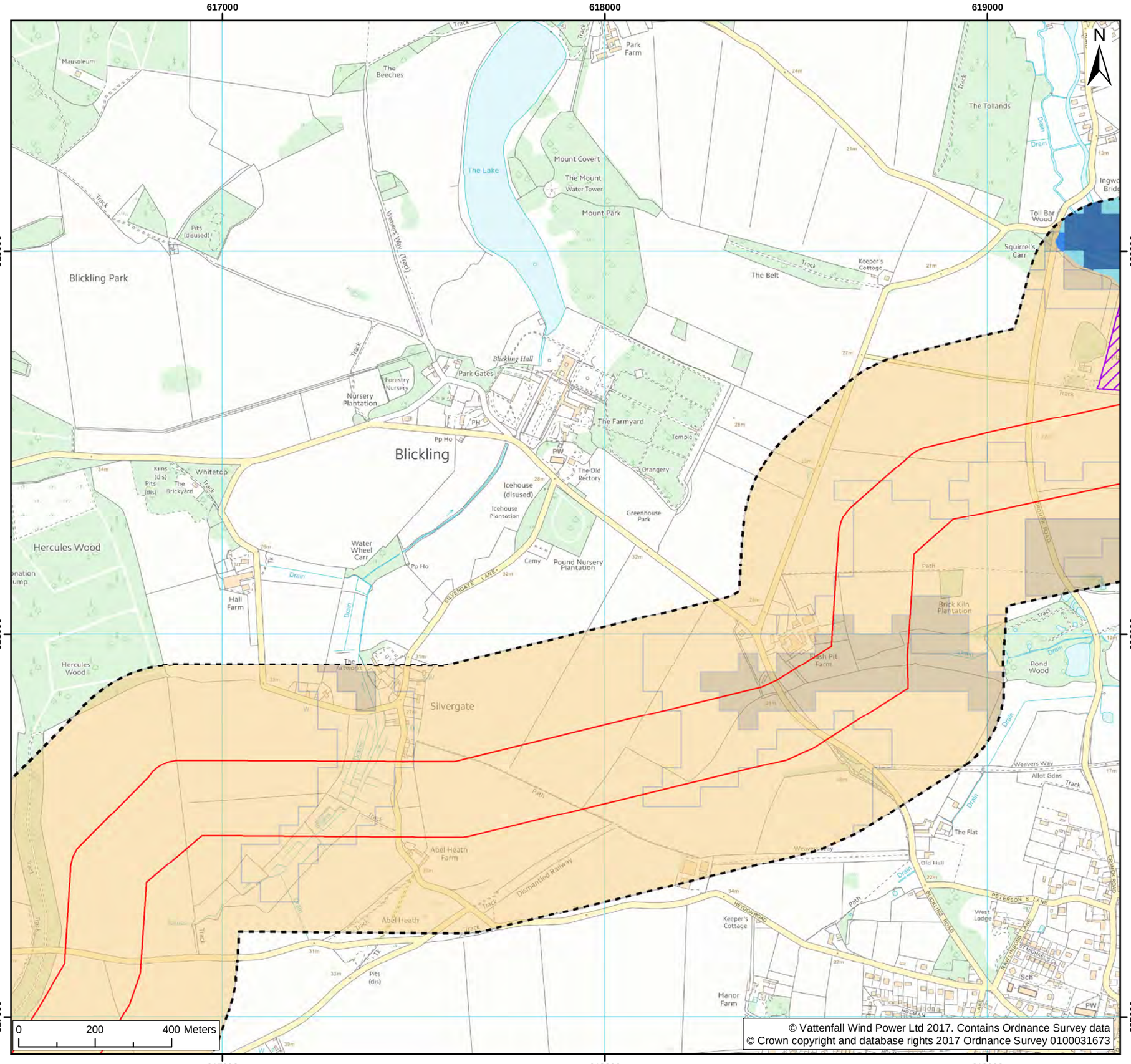

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map11 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

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Co-ordinate system: British National Grid **EPSG:** 27700

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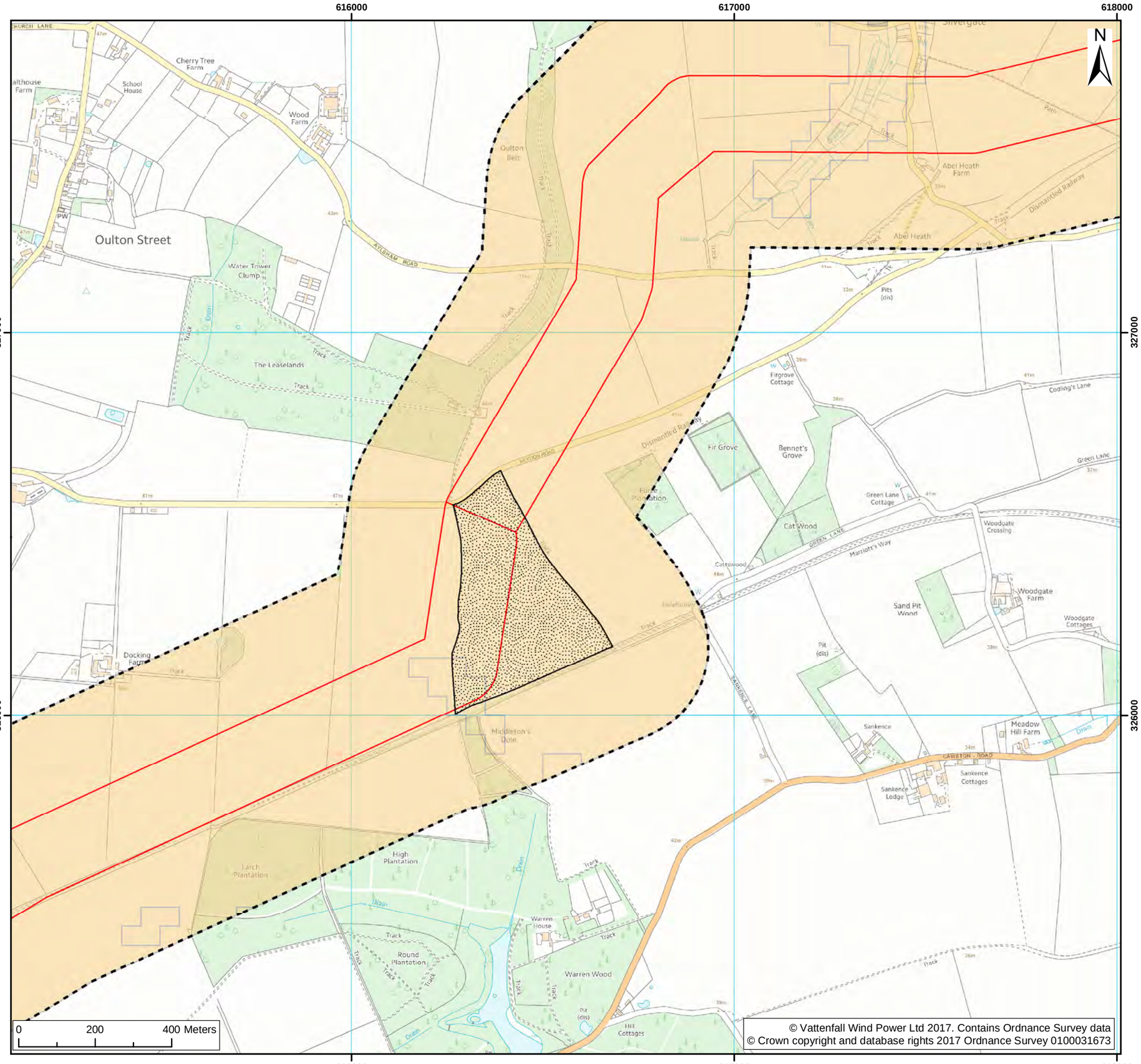

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map12 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

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Co-ordinate system: British National Grid **EPSG:** 27700

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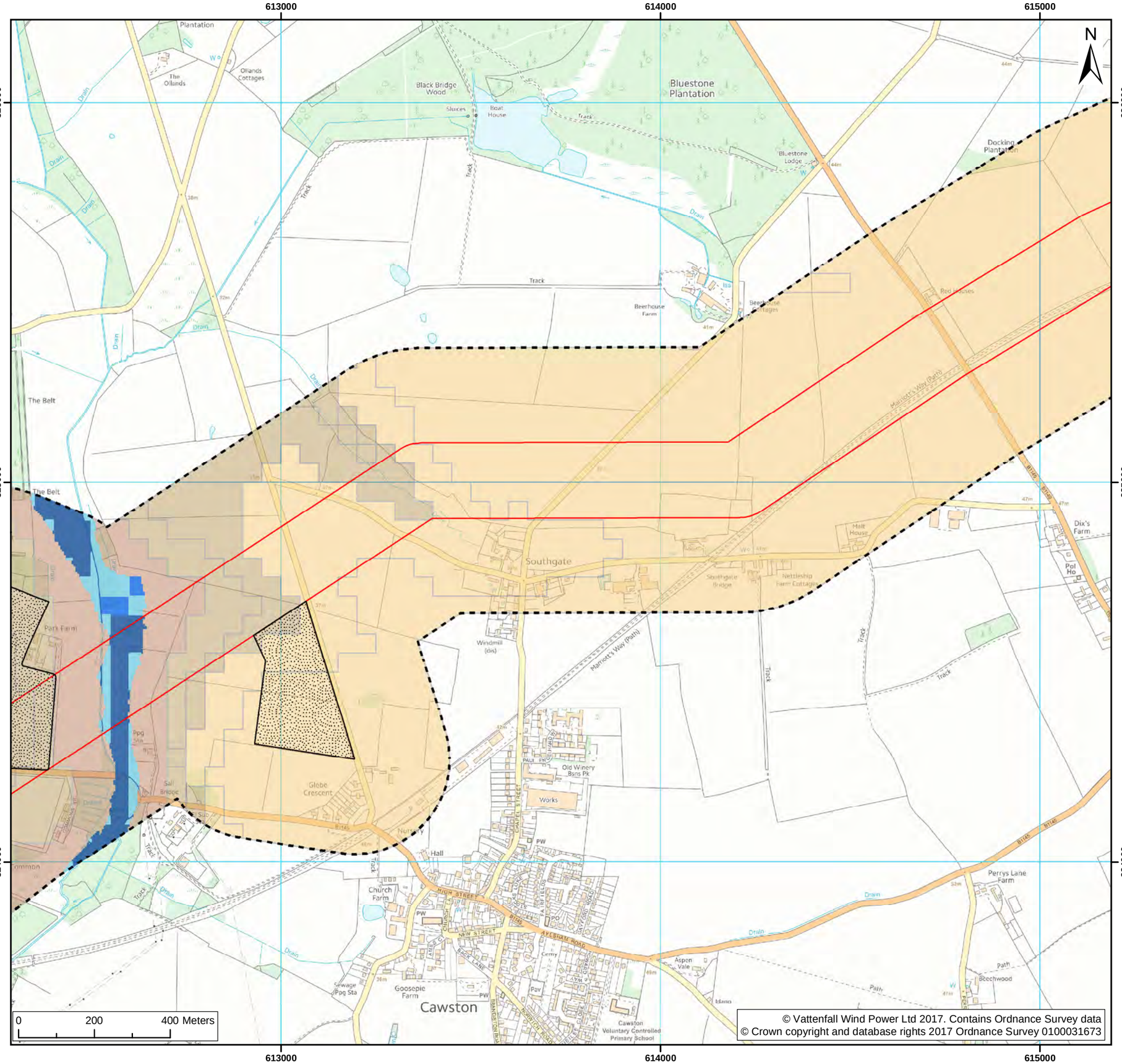

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map13 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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610000 611000 612000

325000 324000 323000

N

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map14 of 25)

Figure: 19.6 Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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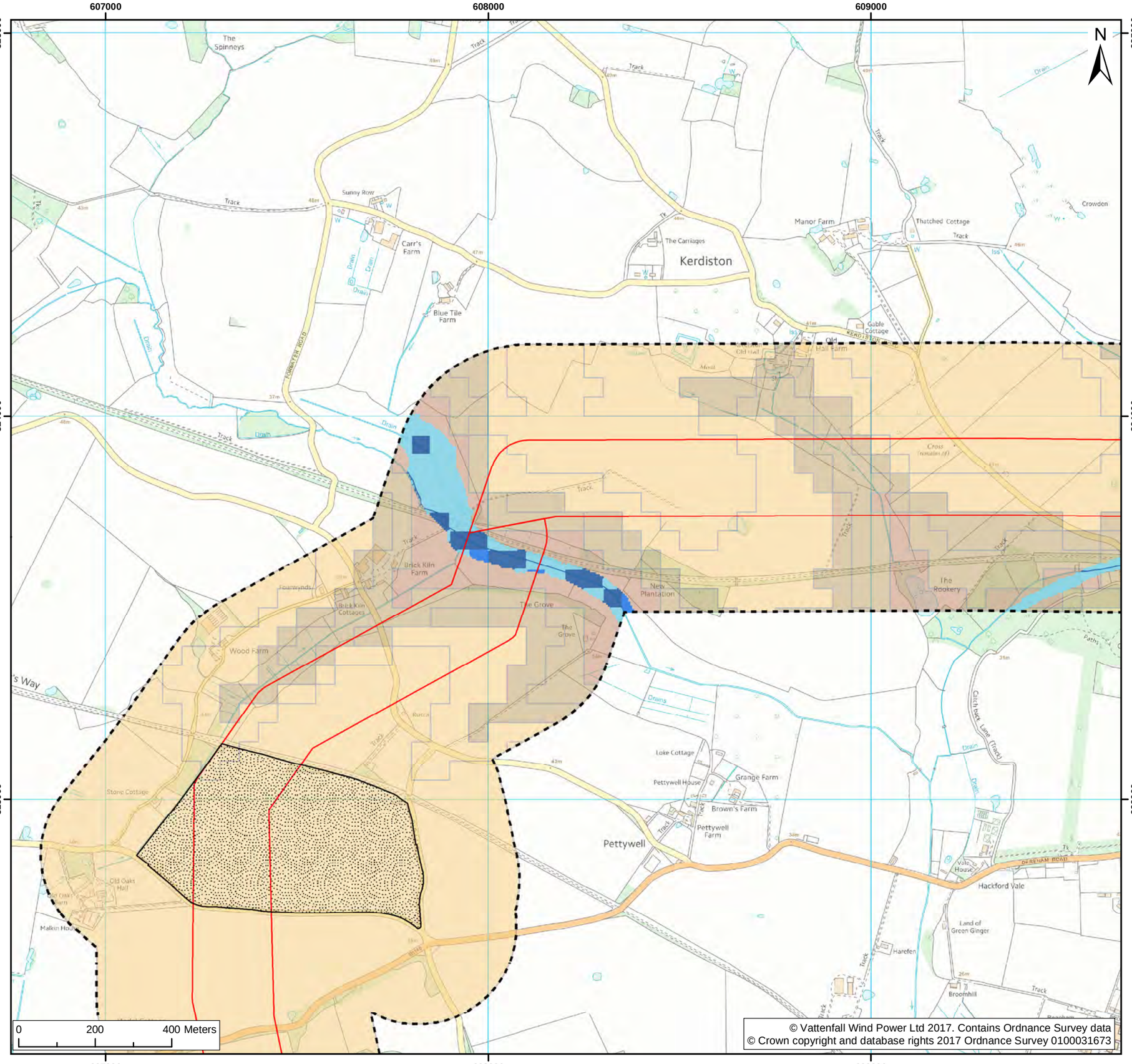

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map15 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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606000
607000
322000
321000
N
0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map16 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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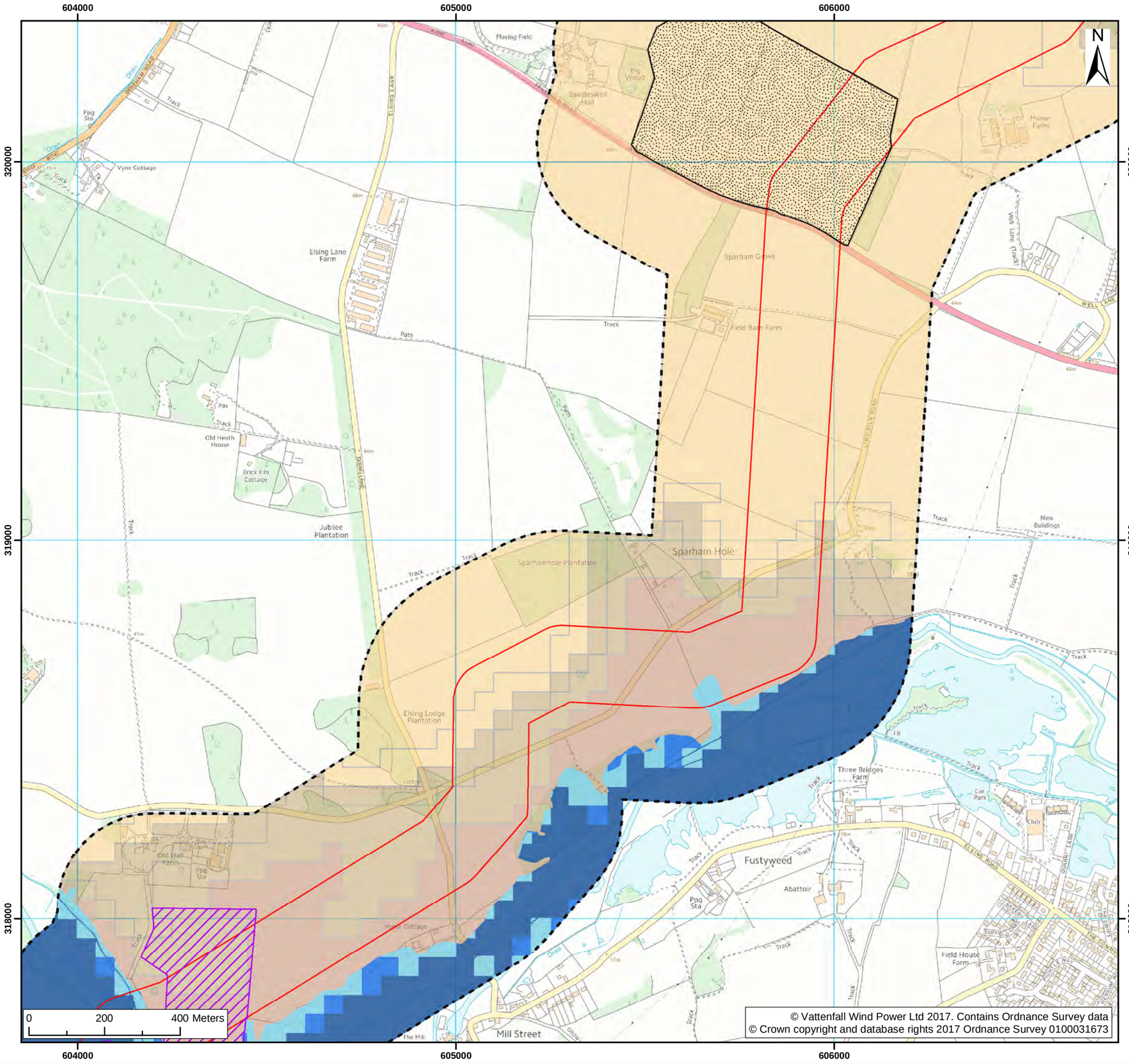

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map17 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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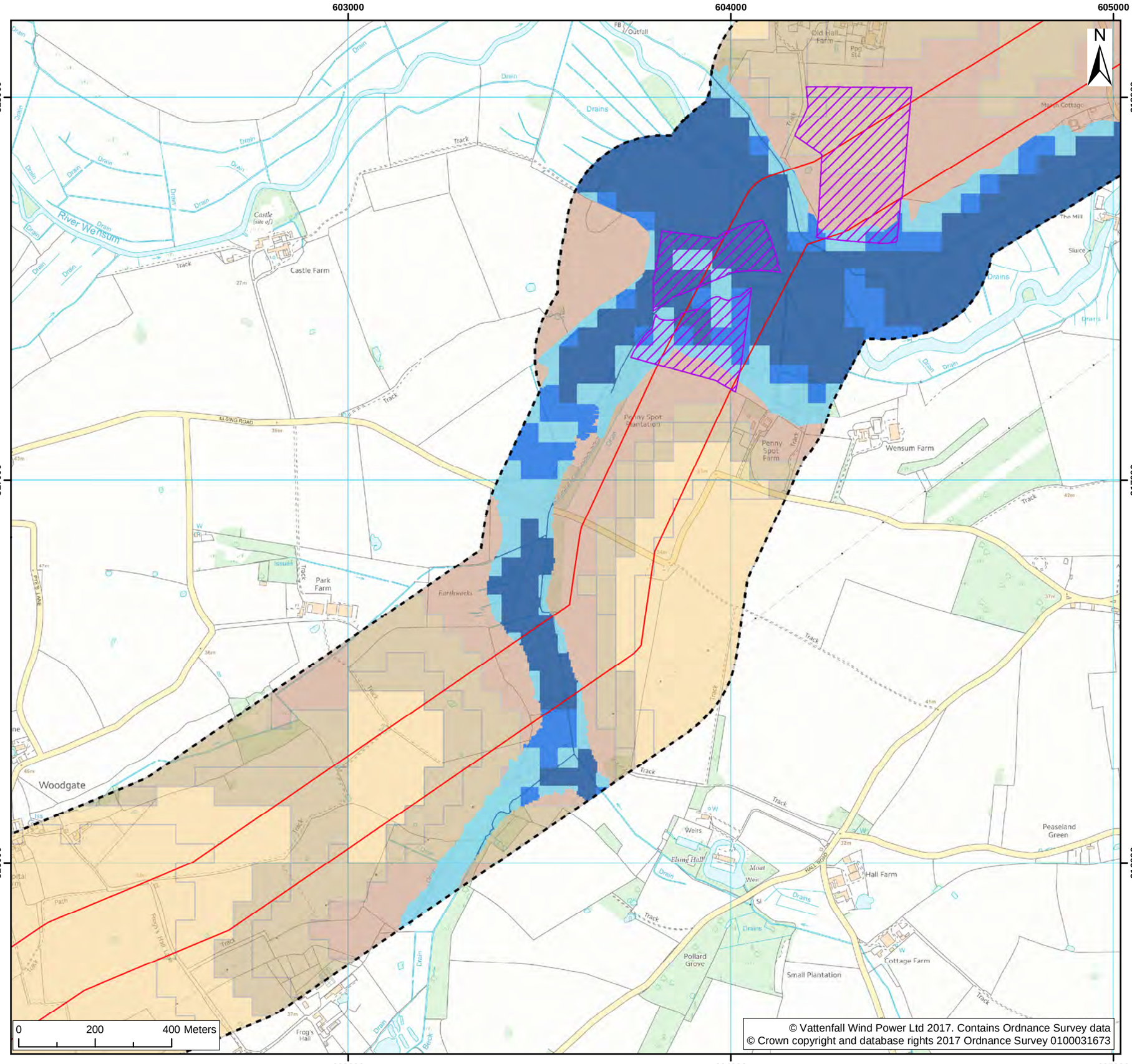

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map18 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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600000 601000 602000

317000 316000 315000

N

Swanton Morley VC Primary School
Greenfields Cottage
Playing Field
Hall
Harket's Lane (Track)
Works
Ppg Sta
PH
Green Lane (Track)
Track
Drain
Greengate
Swanton Morley
Chapel Farm
Greengate House Farm
Hazeldene Farm
Woodgate
Woodgate Farm
Hospital Farm
Woodgate Hall Farm
Playing Field
The Brambles
Home Farm
Lincoln House
Walnut Tree Farm
Swanton Road Farm
Greenfields
Foxbow
Northall Green Farm
Gooch's Cottages
Bird's Lane (Track)
Daisy Lane (Track)
Path
Pav
Tk
Nursery

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map19 of 25)

Figure: 19.6 Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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598000

599000

316000

315000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- Medium

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map20 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 200 400 Meters

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595000 596000 597000

315000 314000 313000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map21 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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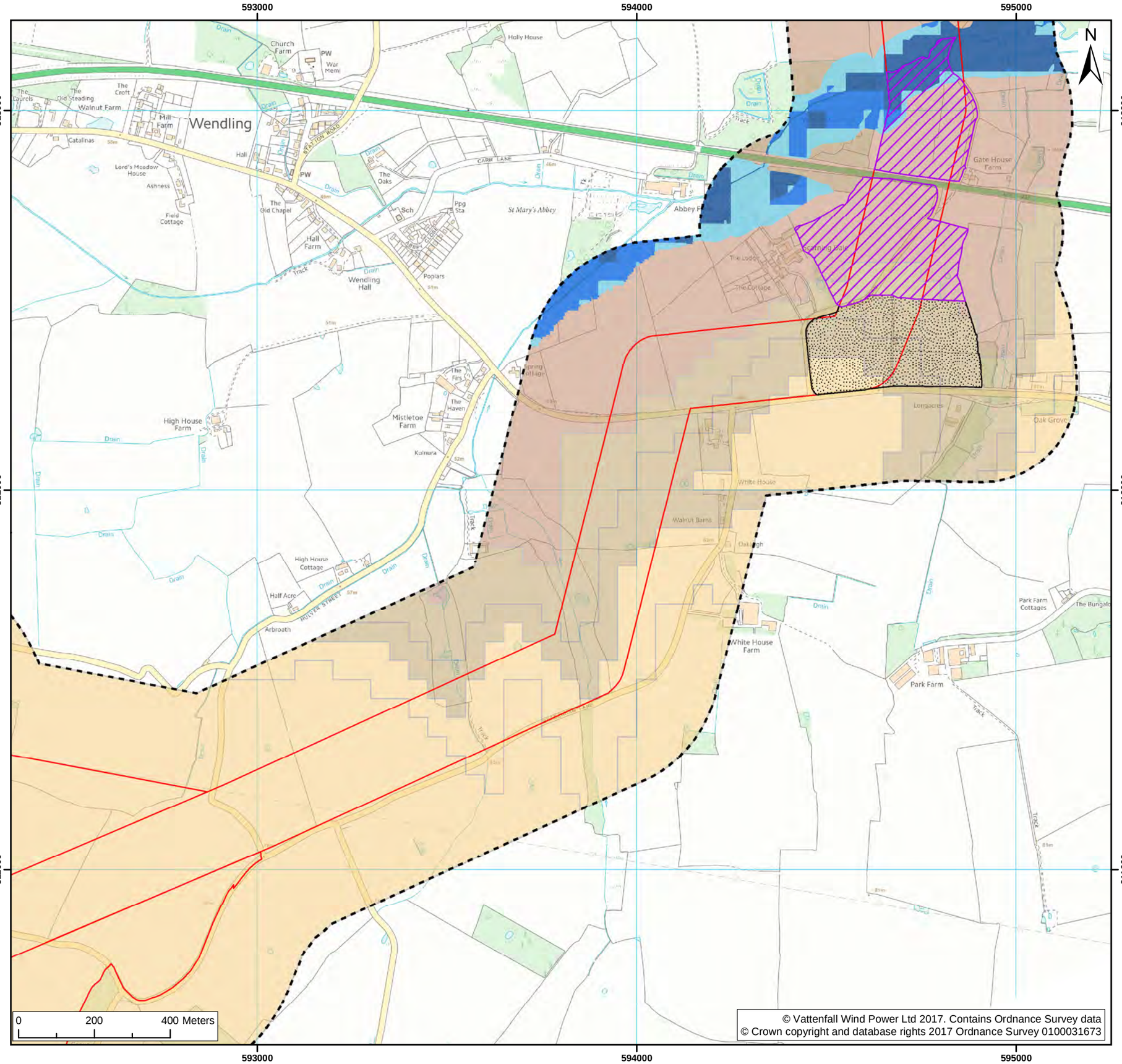
0 200 400 Meters



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map22 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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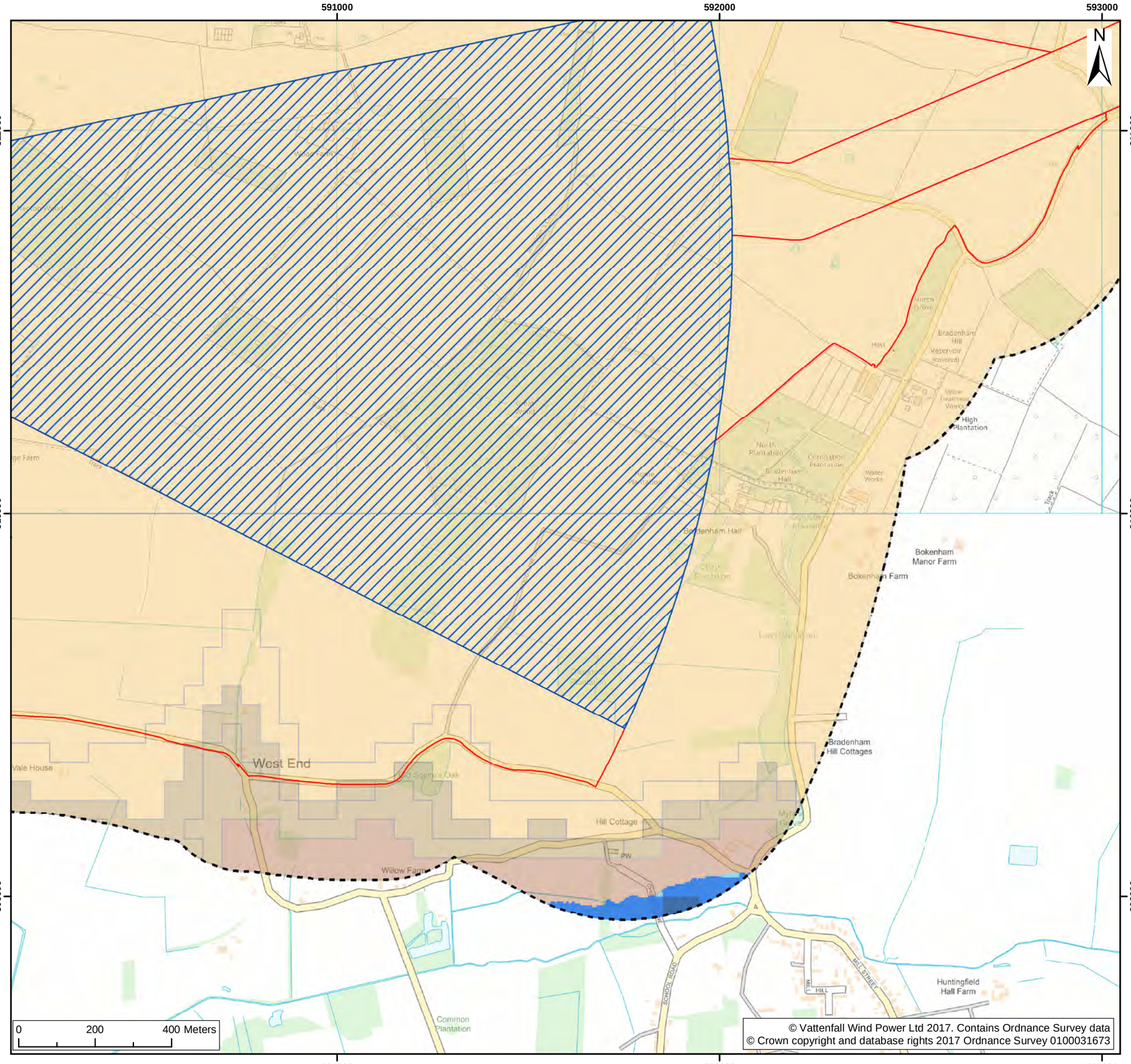

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map23 of 25)

Figure:	Drawing No:
19.6	PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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590000 591000 592000

312000

311000

N

Little Fransham

Glebe Close

Willow Farm

Lyon's Green

Fruit Farm

Lower Farm

Wood Farm Cottages

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map24 of 25)

Figure: 19.6 | Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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588000 589000 590000

311000

310000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Groundwater Flood Susceptibility[1]

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding Below Ground Level

Risk of Flooding from Rivers and Seas[1]

- High
- Medium
- Low

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater and Surface Water Flood Risk Map (Map25 of 25)

Figure: 19.6 Drawing No: PB4476-004-0191-006

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 200 400 Meters

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638000 639000 640000

331000

330000

329000

N

Happisburgh

Whimpwell Green

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 1 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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635000 636000 637000

331000

330000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Groundwater Quality (Map 2 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 200 400 Meters

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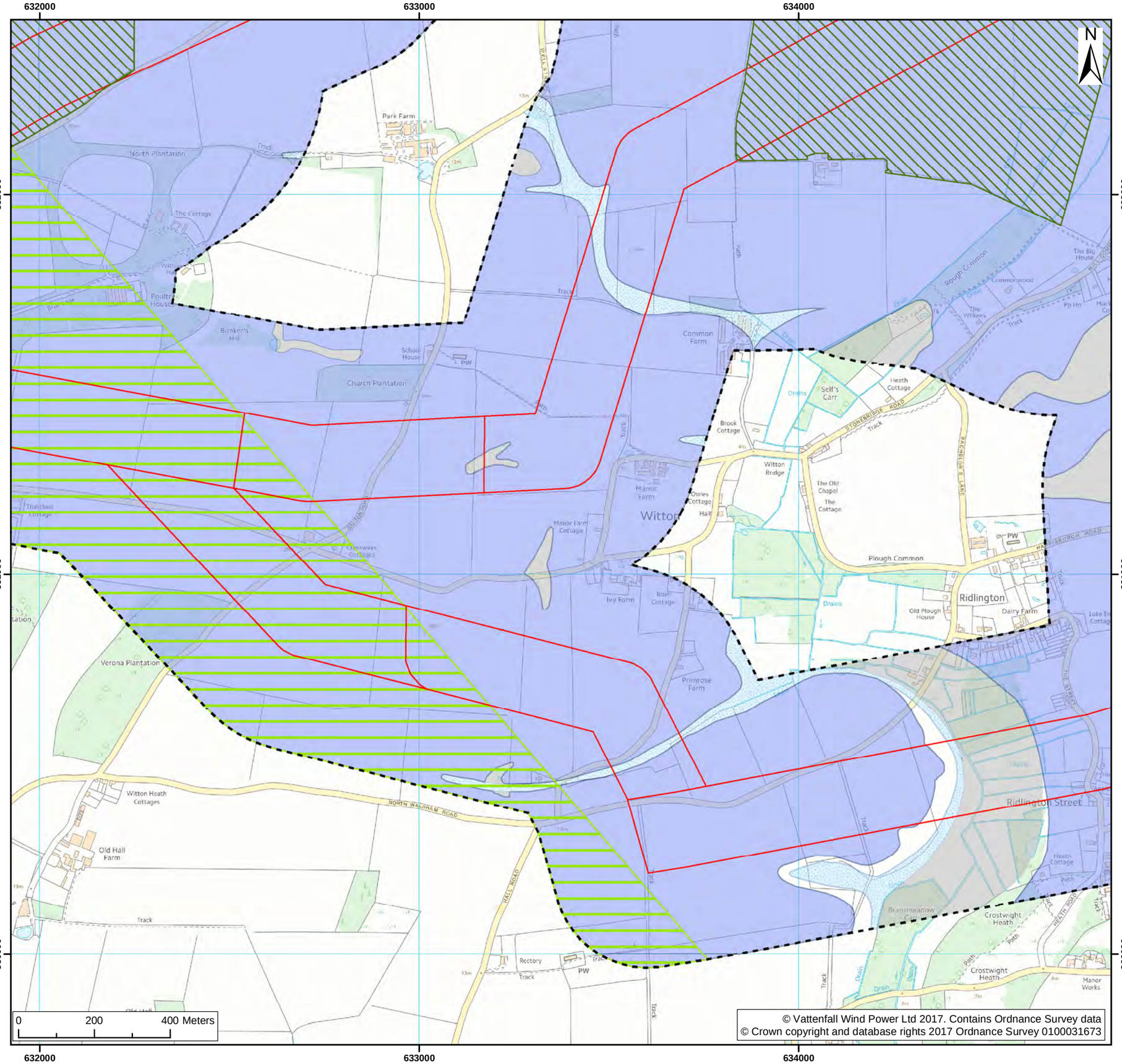

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

Source Protection Zones[1]

- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 3 of 25)

Figure:	Drawing No:
19.5	PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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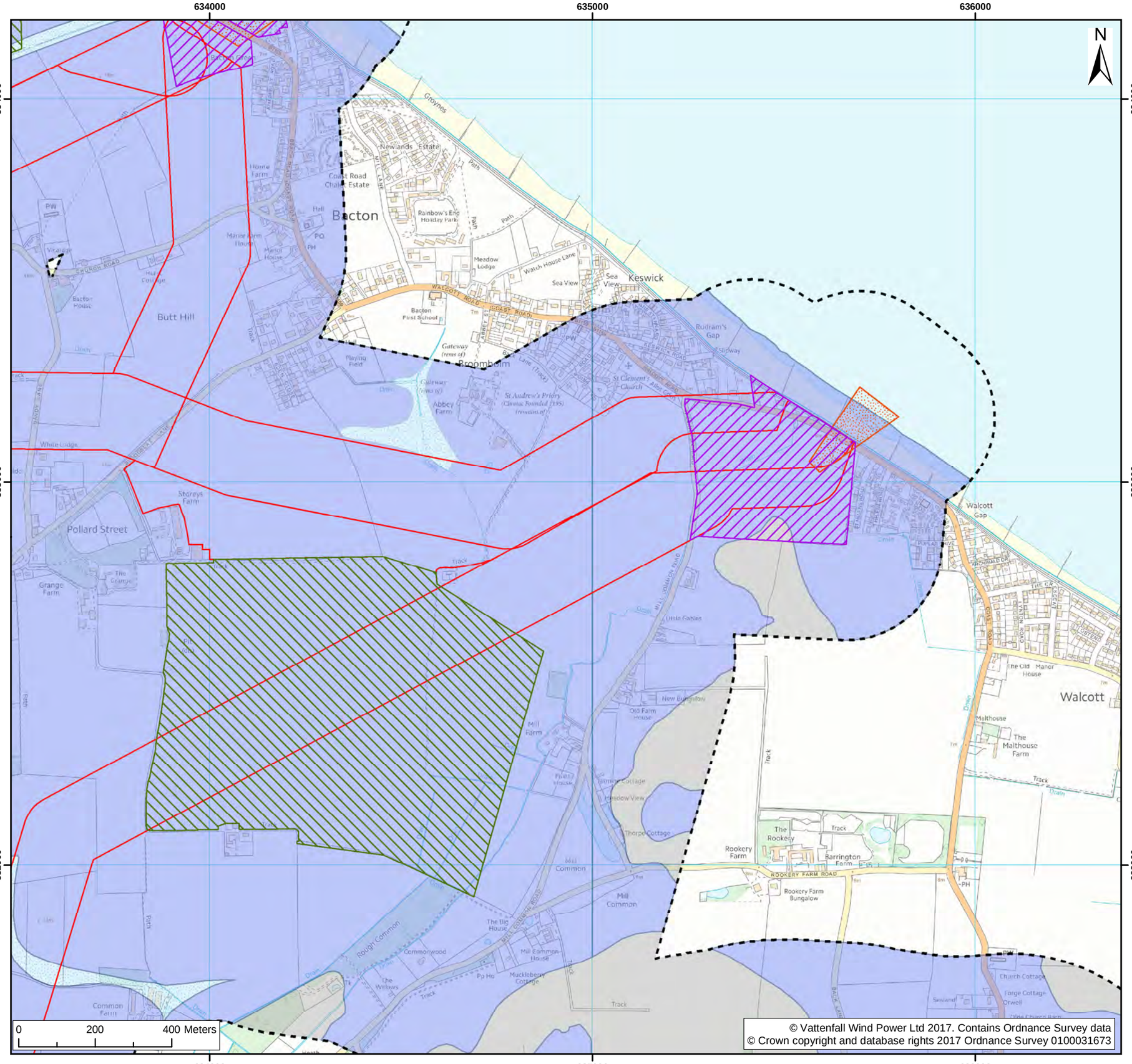

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 4 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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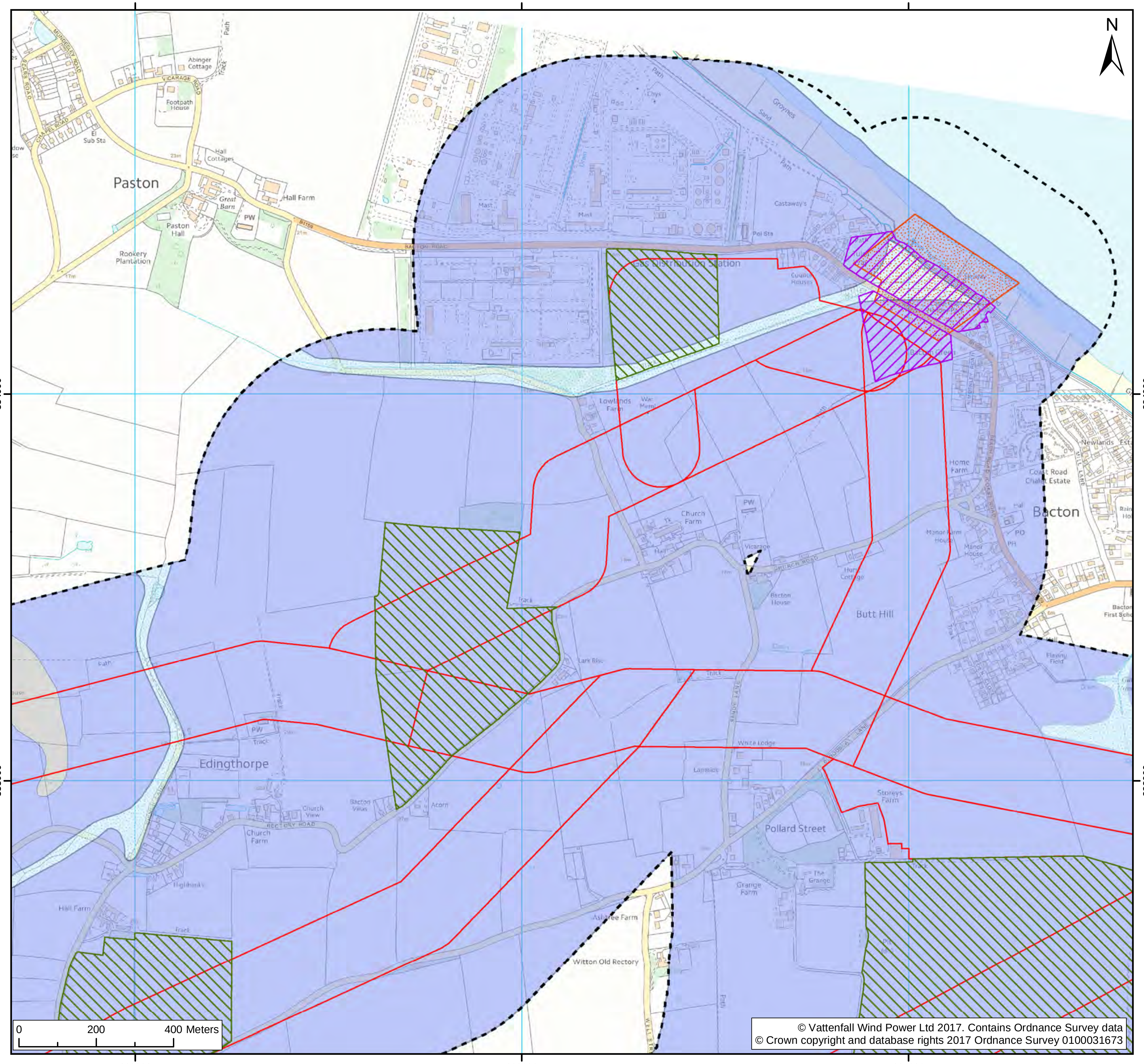

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 5 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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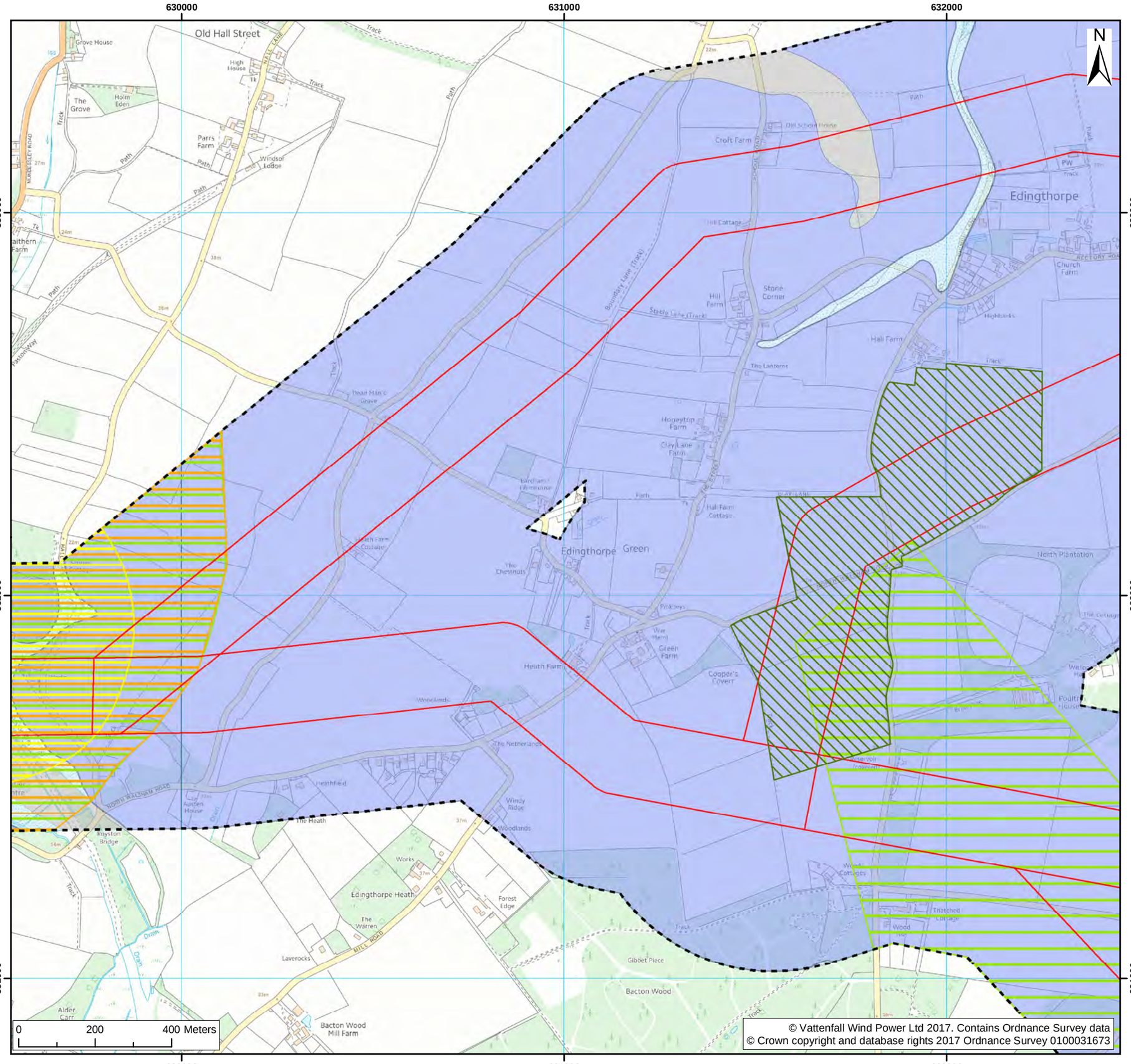

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 6 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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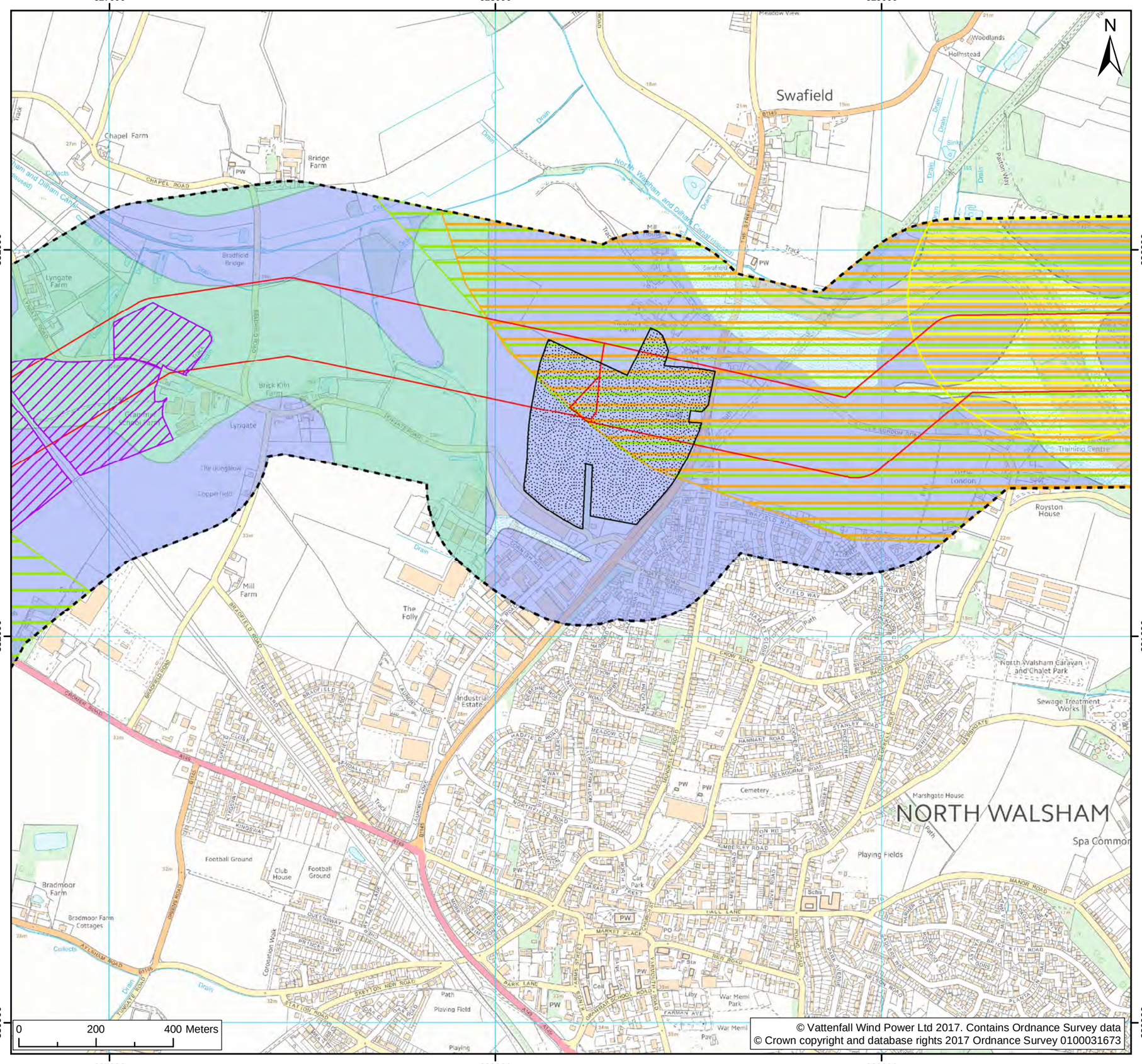
627000 628000 629000

332000 331000 330000



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated
- Unproductive Strata

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 7 of 25)

Figure:	Drawing No:
19.5	PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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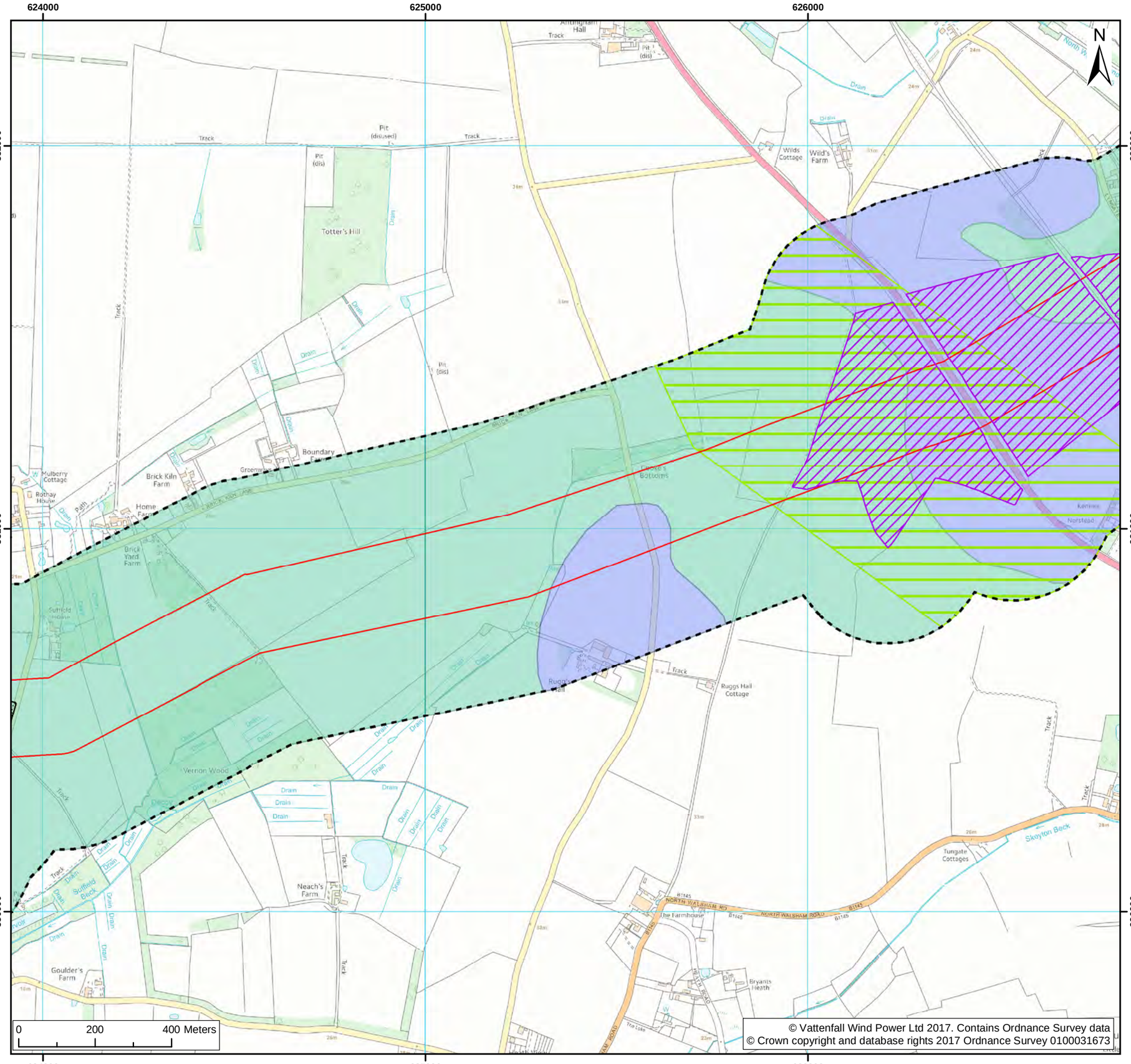

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B

Source Protection Zones[1]

- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 8 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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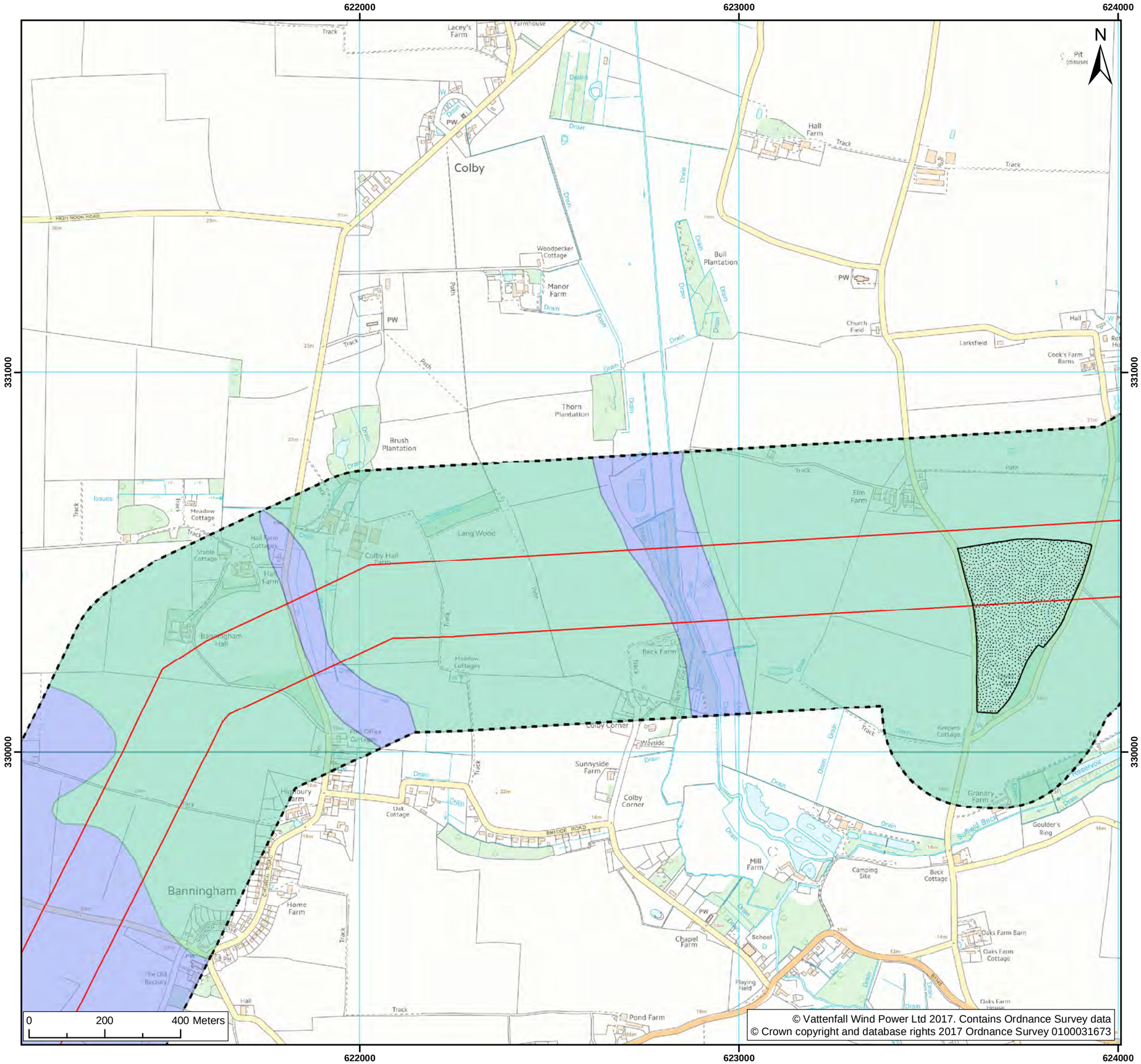

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 9 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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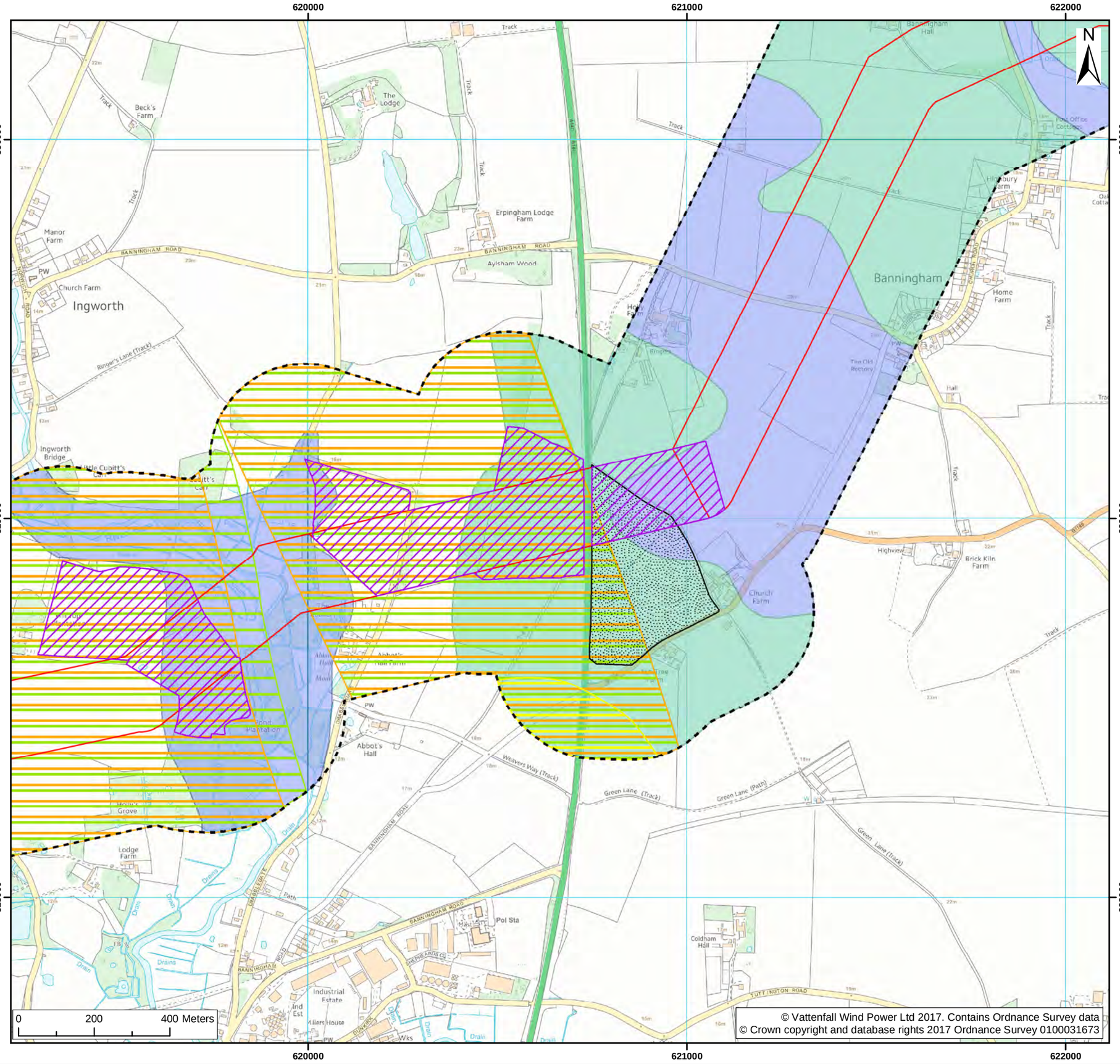
Royal HaskoningDHV
Enhancing Society Together



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 10 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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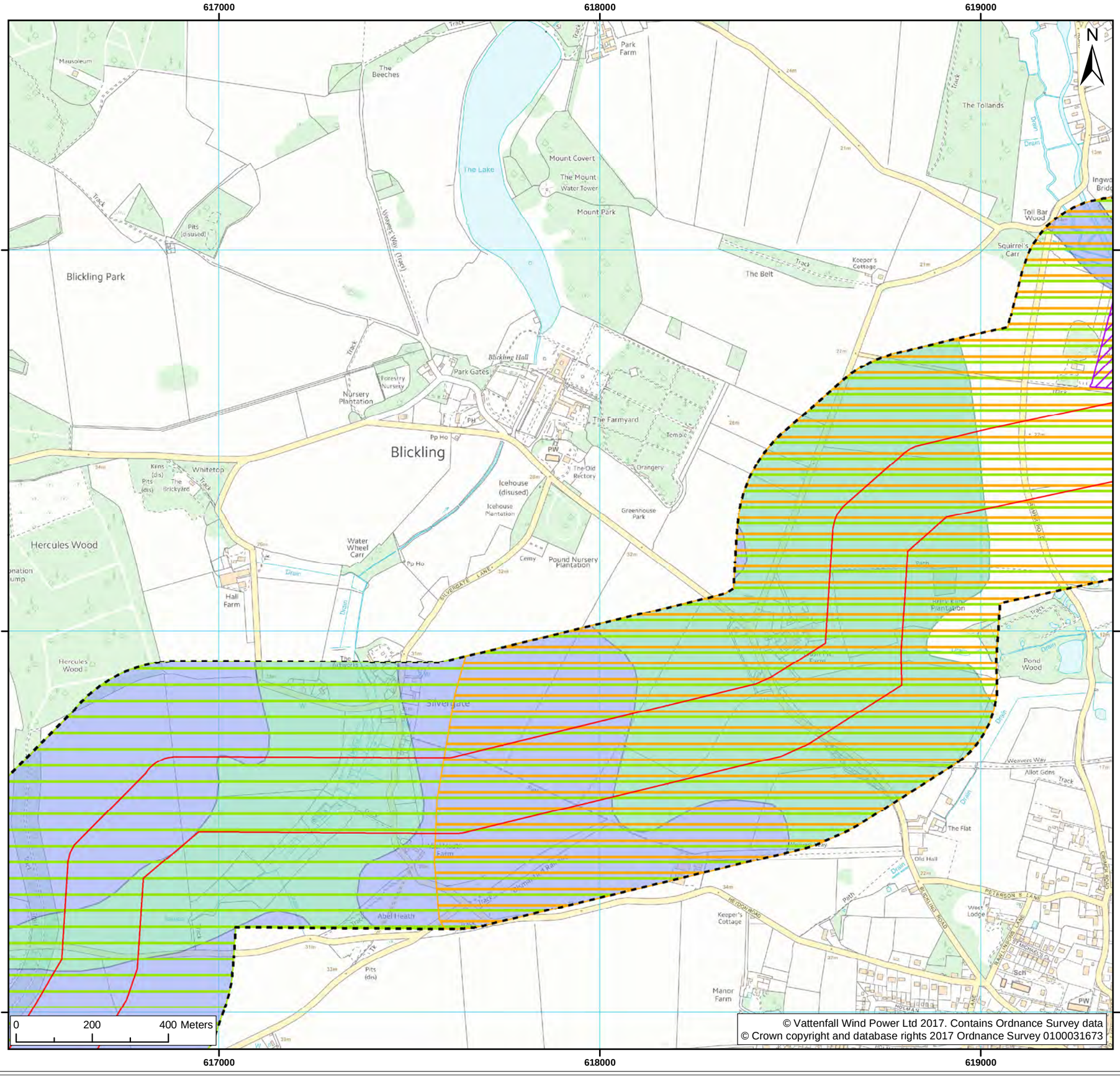

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B

Source Protection Zones[1]

- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 11 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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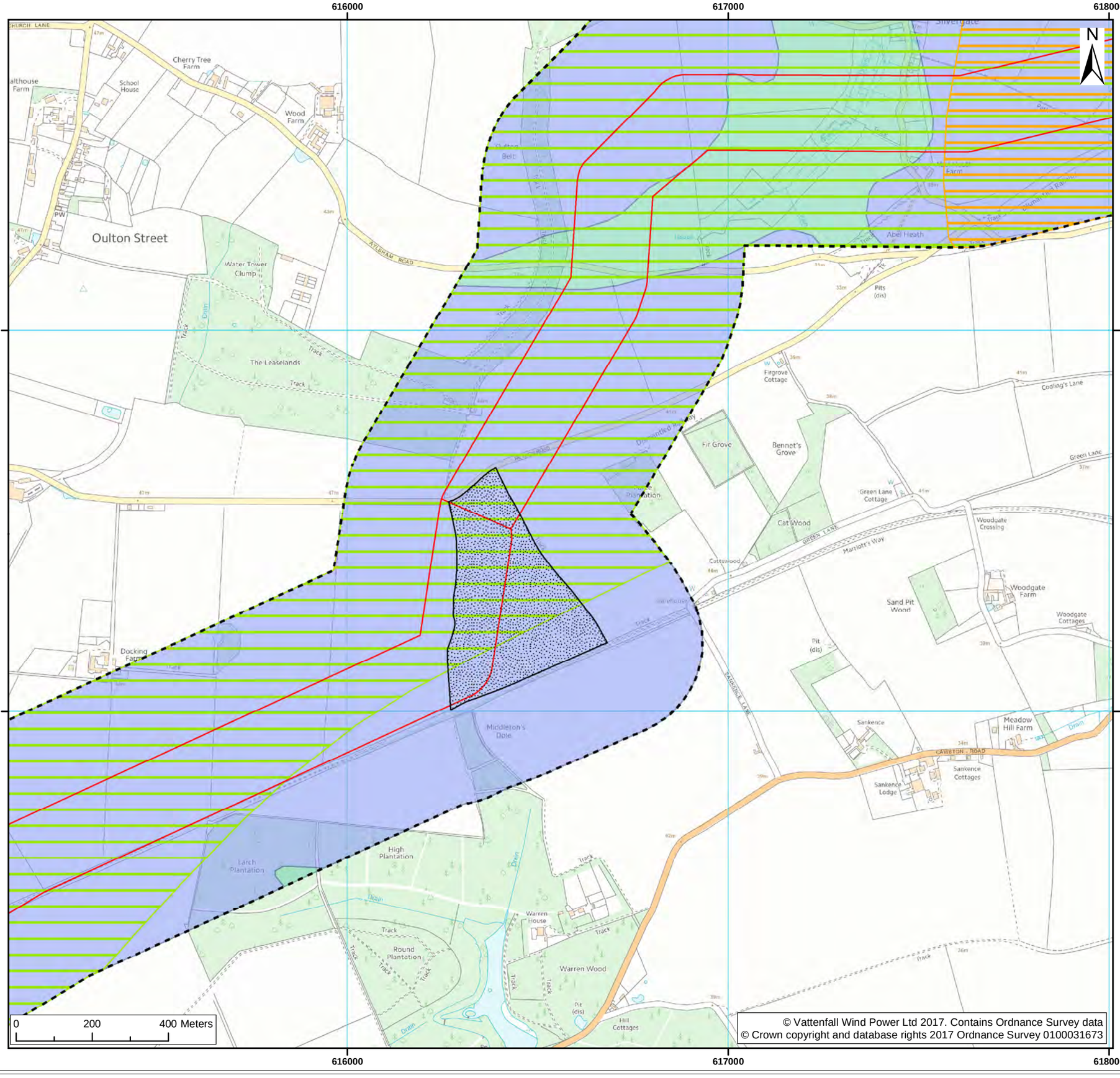

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B

Source Protection Zones[1]

- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 12 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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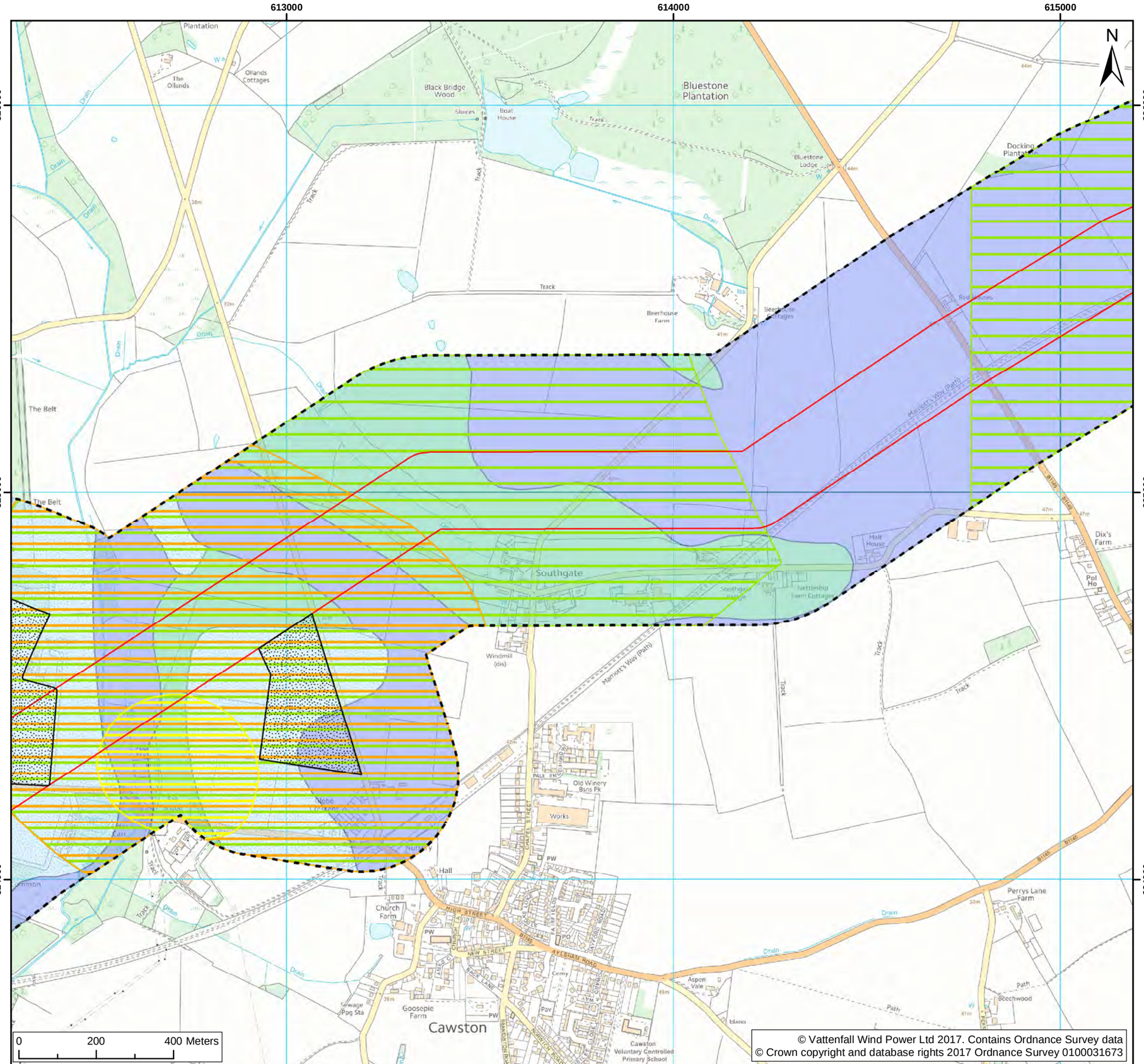

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 13 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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610000 611000 612000

325000 324000 323000

N

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 14 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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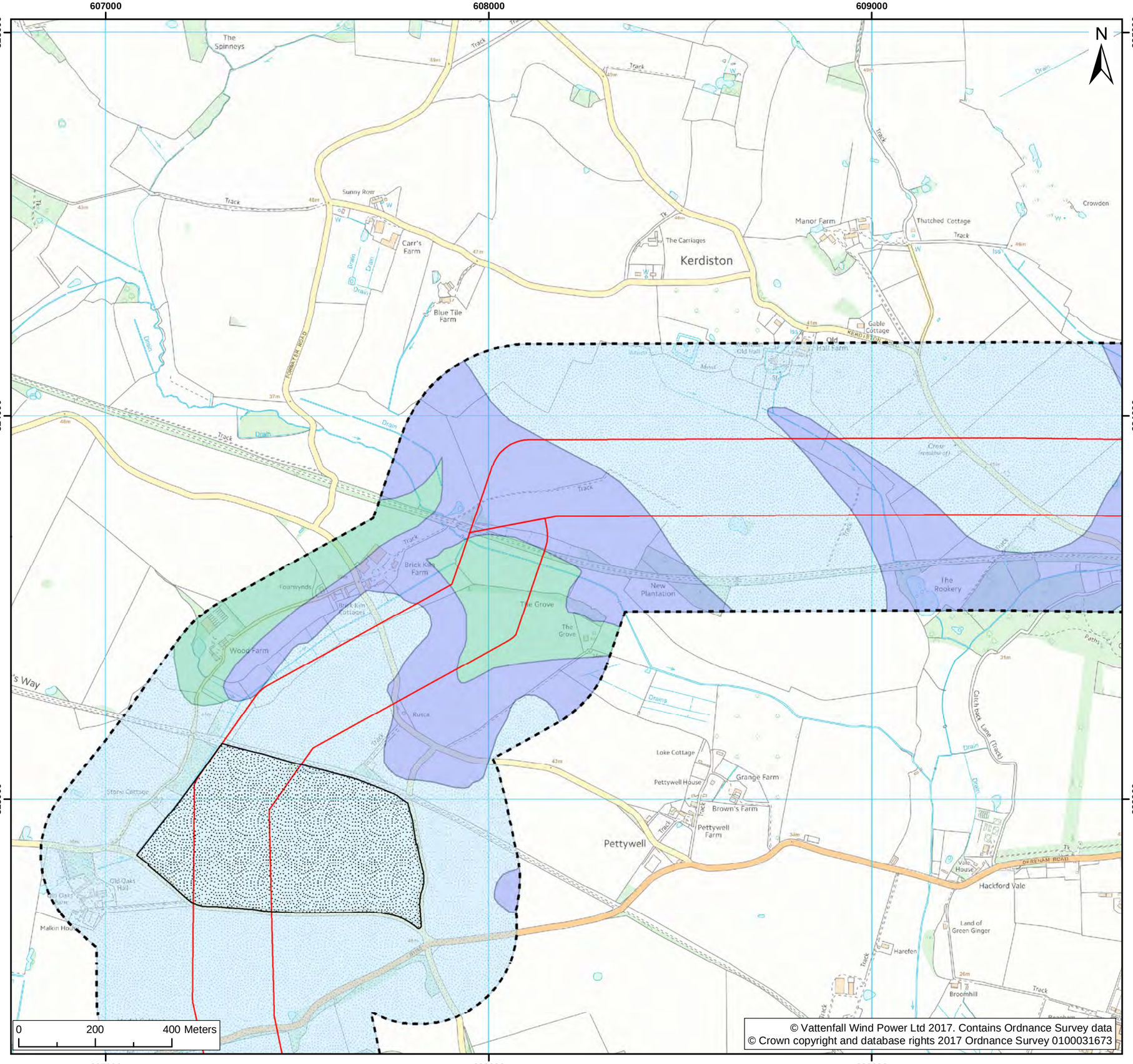

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 15 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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606000

607000

322000

321000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

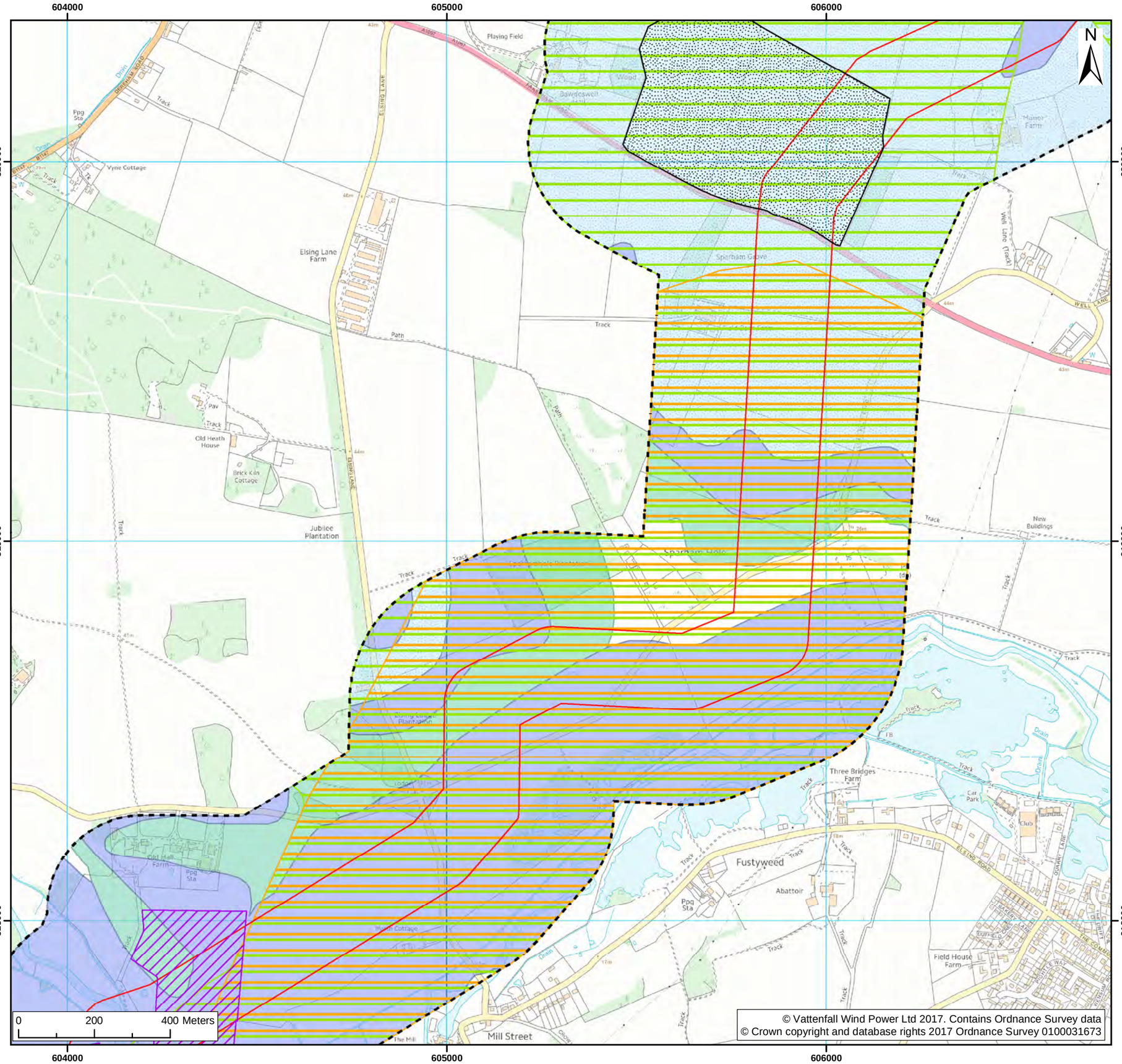
Groundwater Quality
(Map 16 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 200 400 Meters



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 17 of 25)

Figure:	Drawing No:
19.5	PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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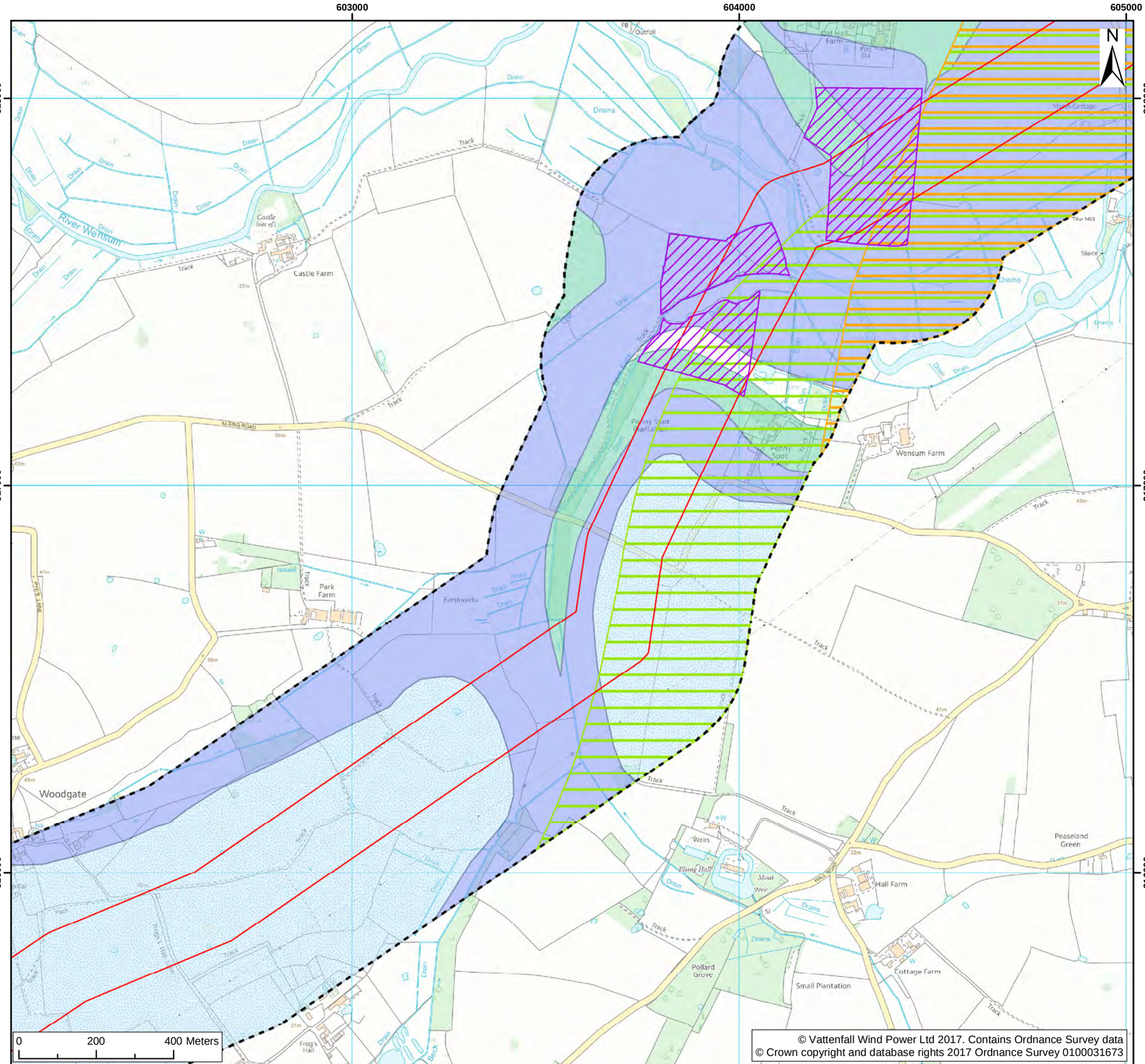

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - B
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 18 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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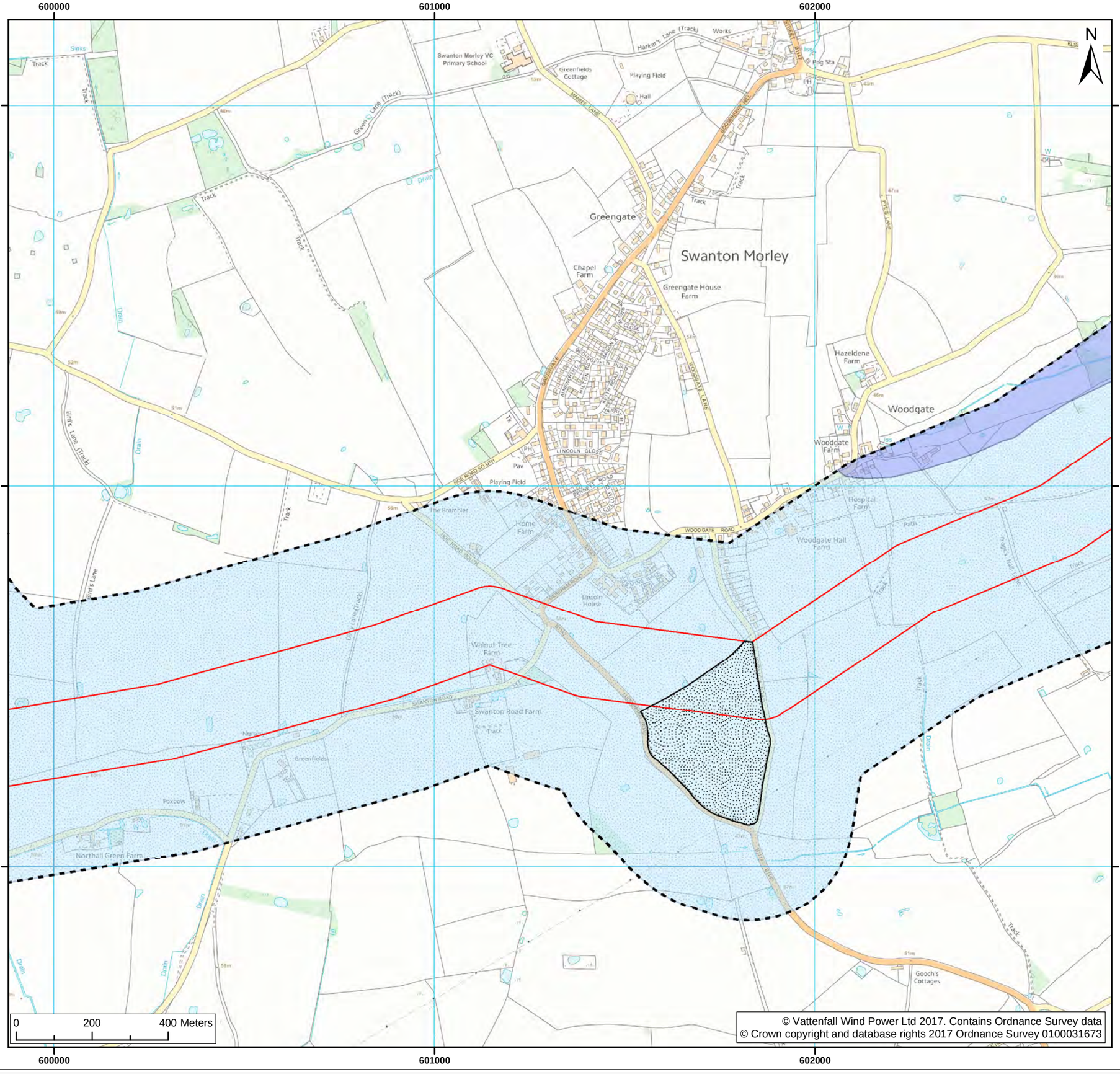

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 19 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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598000

599000

316000

315000

N

0 200 400 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 20 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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595000 596000 597000

315000 314000 313000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

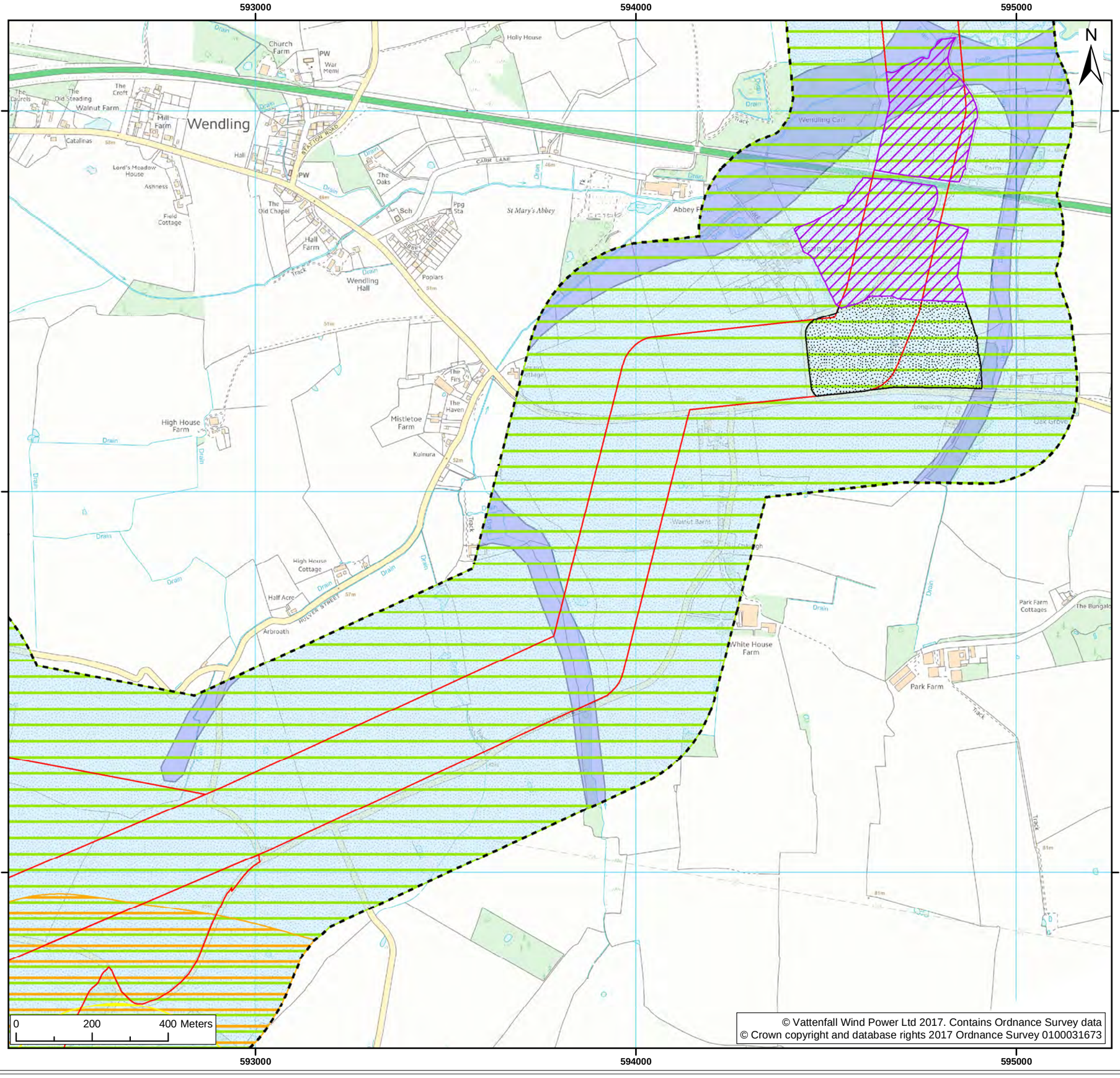
Groundwater Quality
(Map 21 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 200 400 Meters



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 22 of 25)

Figure:	Drawing No:
19.5	PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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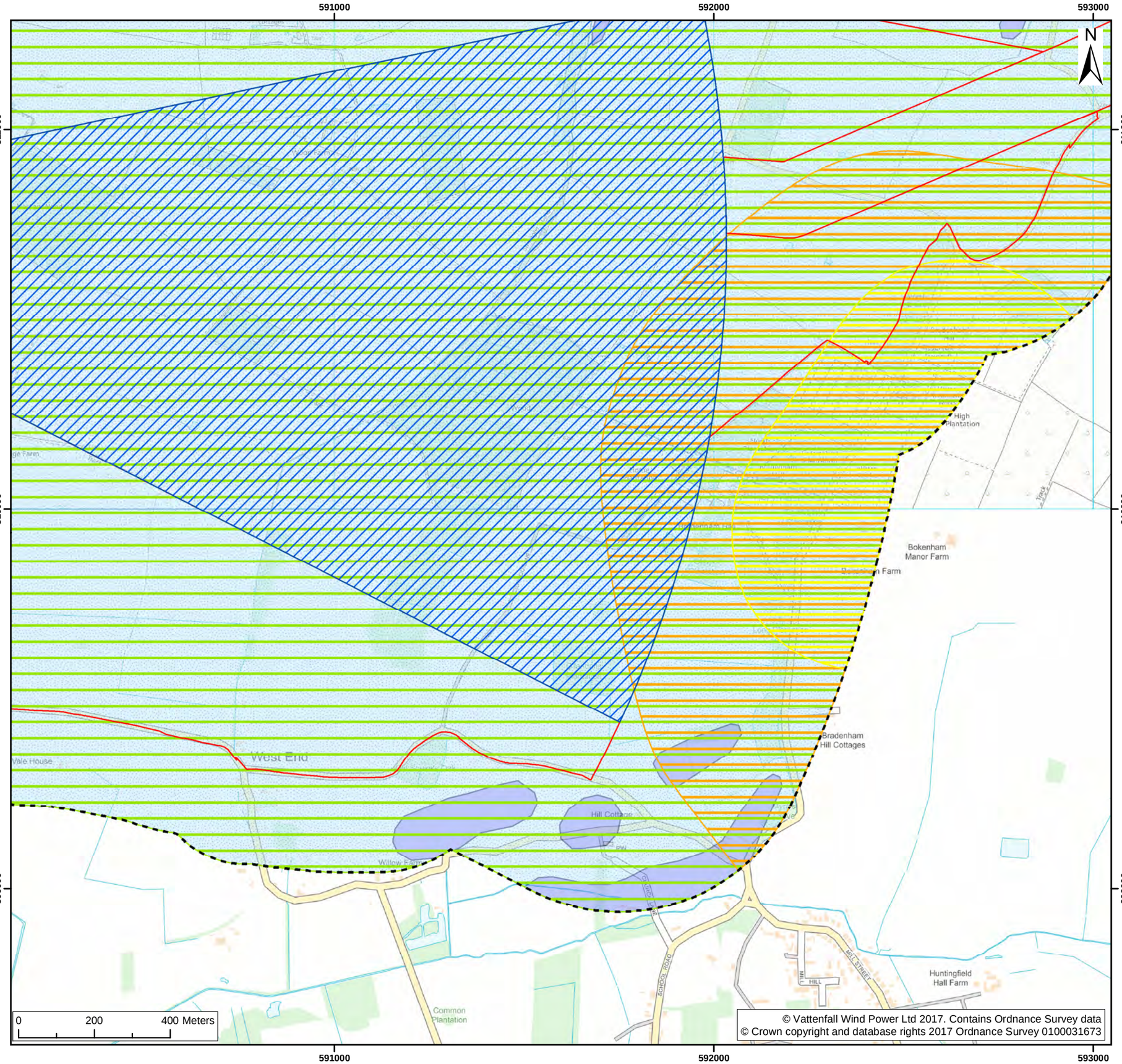

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 23 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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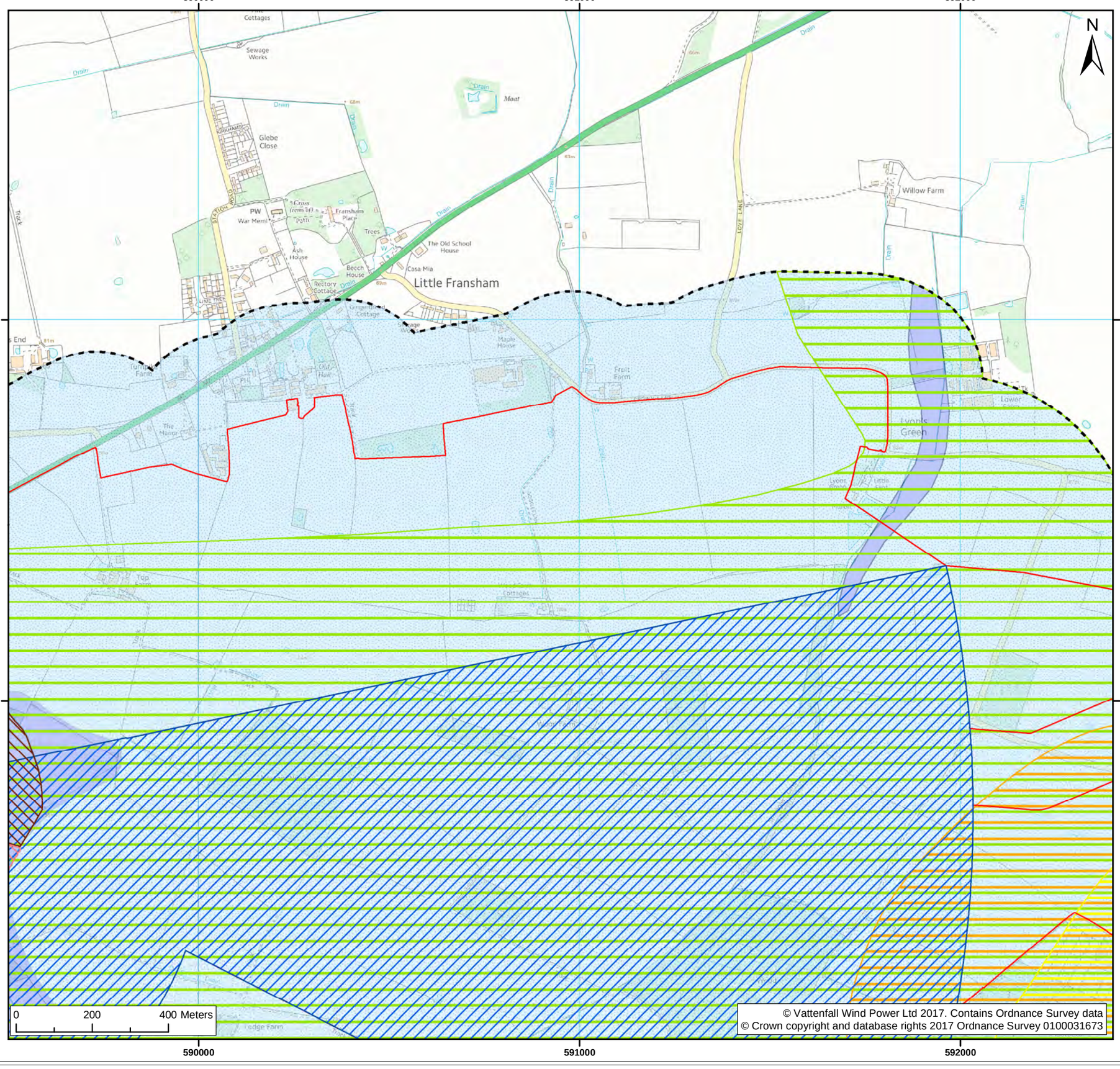
590000 591000 592000

312000

311000



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 24 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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588000 589000 590000

311000

310000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Superficial Aquifer Designations[1]

- Secondary Aquifer - A
- Secondary Aquifer - Undifferentiated

Source Protection Zones[1]

- Source Protection Zone III

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Groundwater Quality
(Map 25 of 25)

Figure: 19.5 | Drawing No: PB4476-004-0191-005

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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0 200 400 Meters

634000 636000 638000 640000

332000

330000

328000

N

0 500 1,000 m

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 1 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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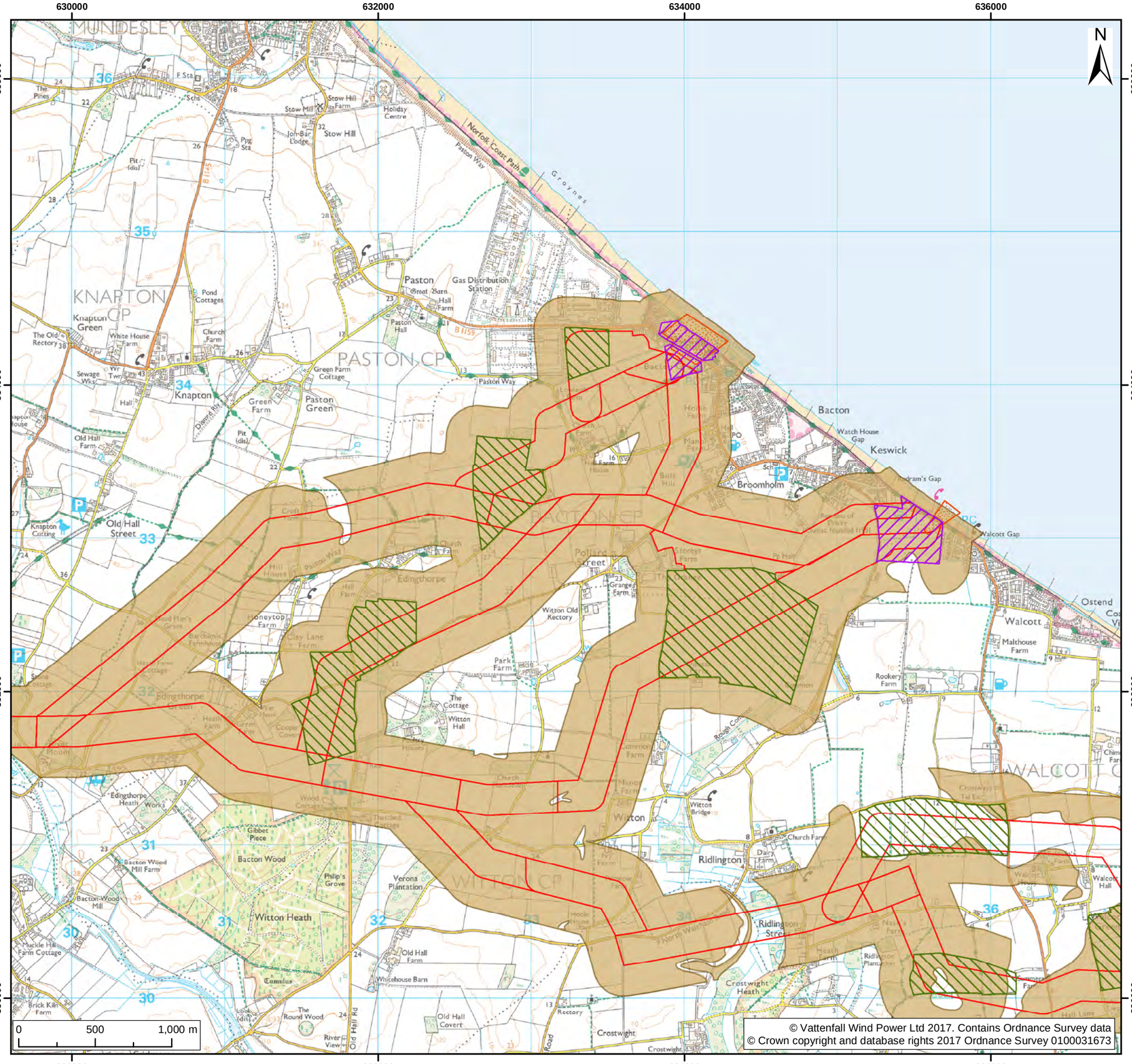

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 2 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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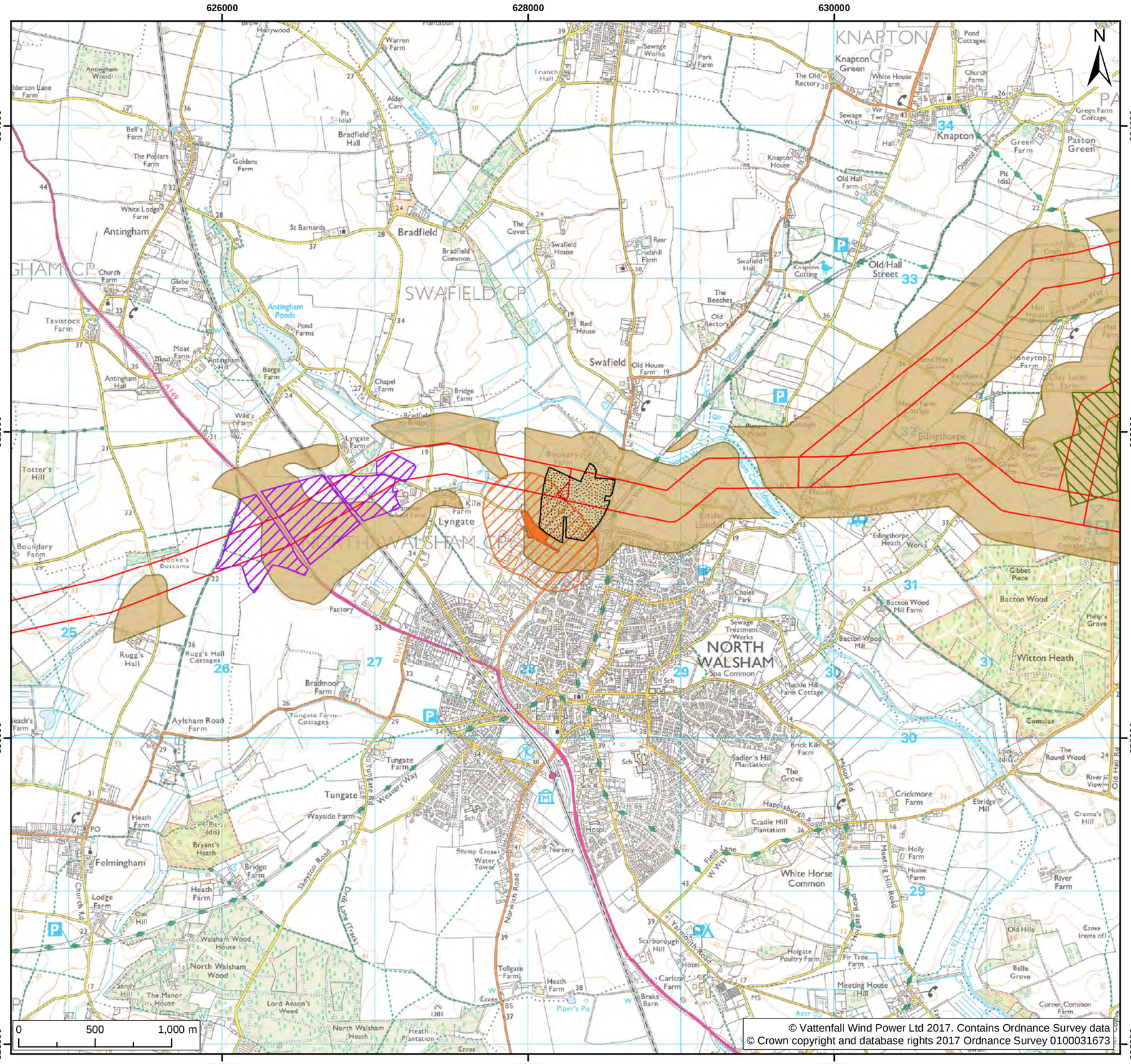

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone

Mineral and Waste Site[1]

- Waste Management Site
- Waste Management Site Consultation Area

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 3 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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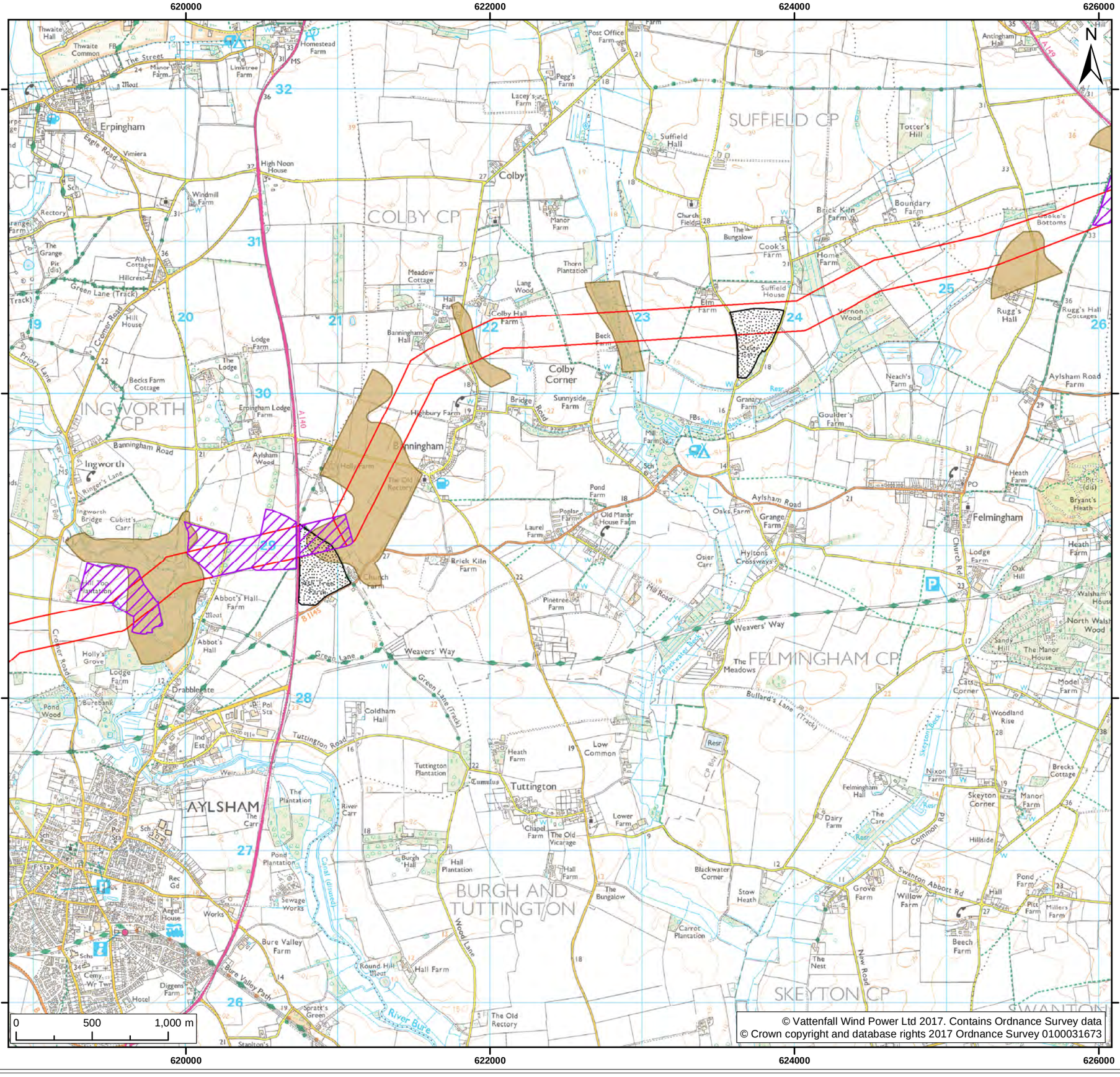

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 4 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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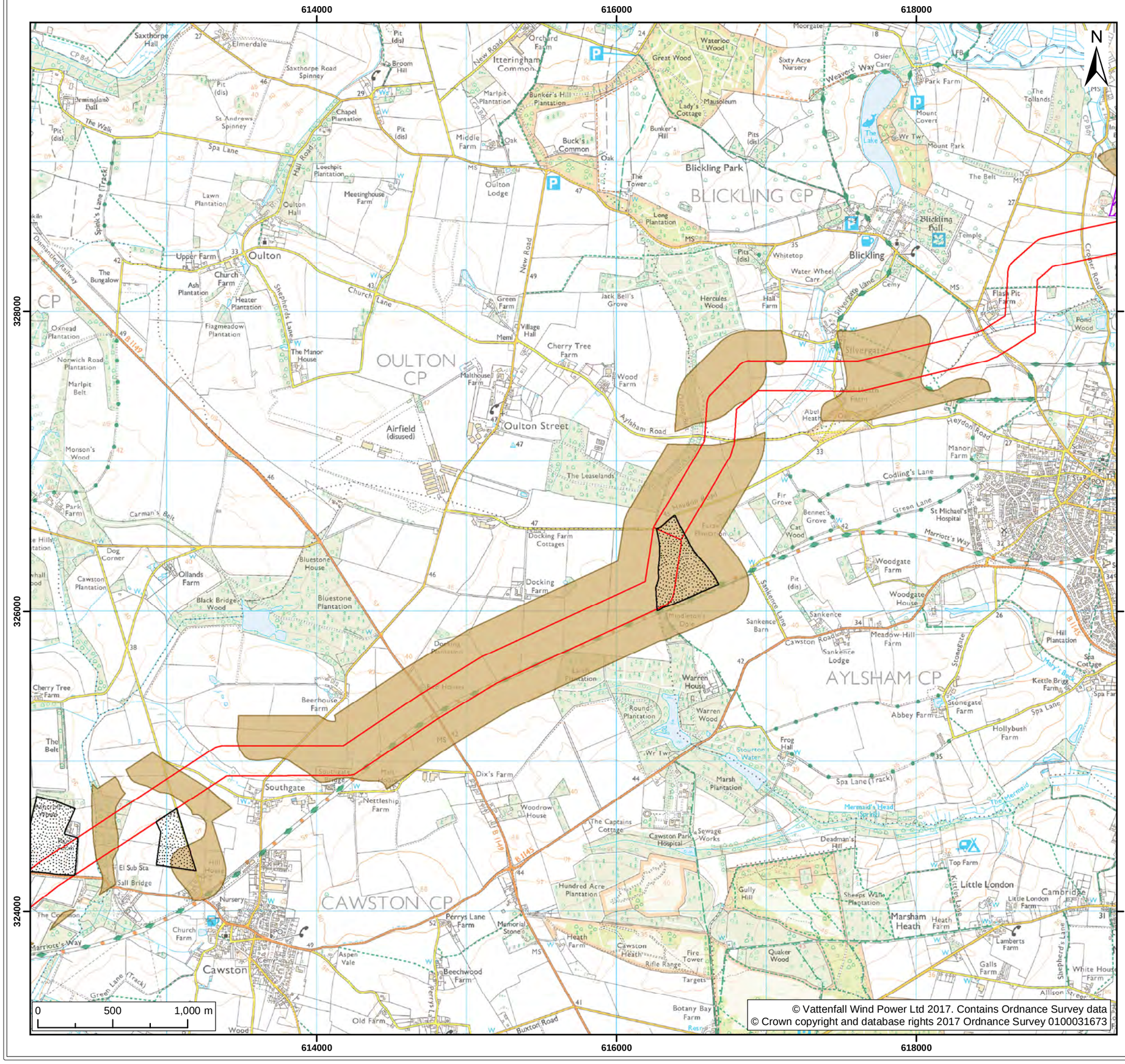

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Mineral Safe Guard Areas (Map 5 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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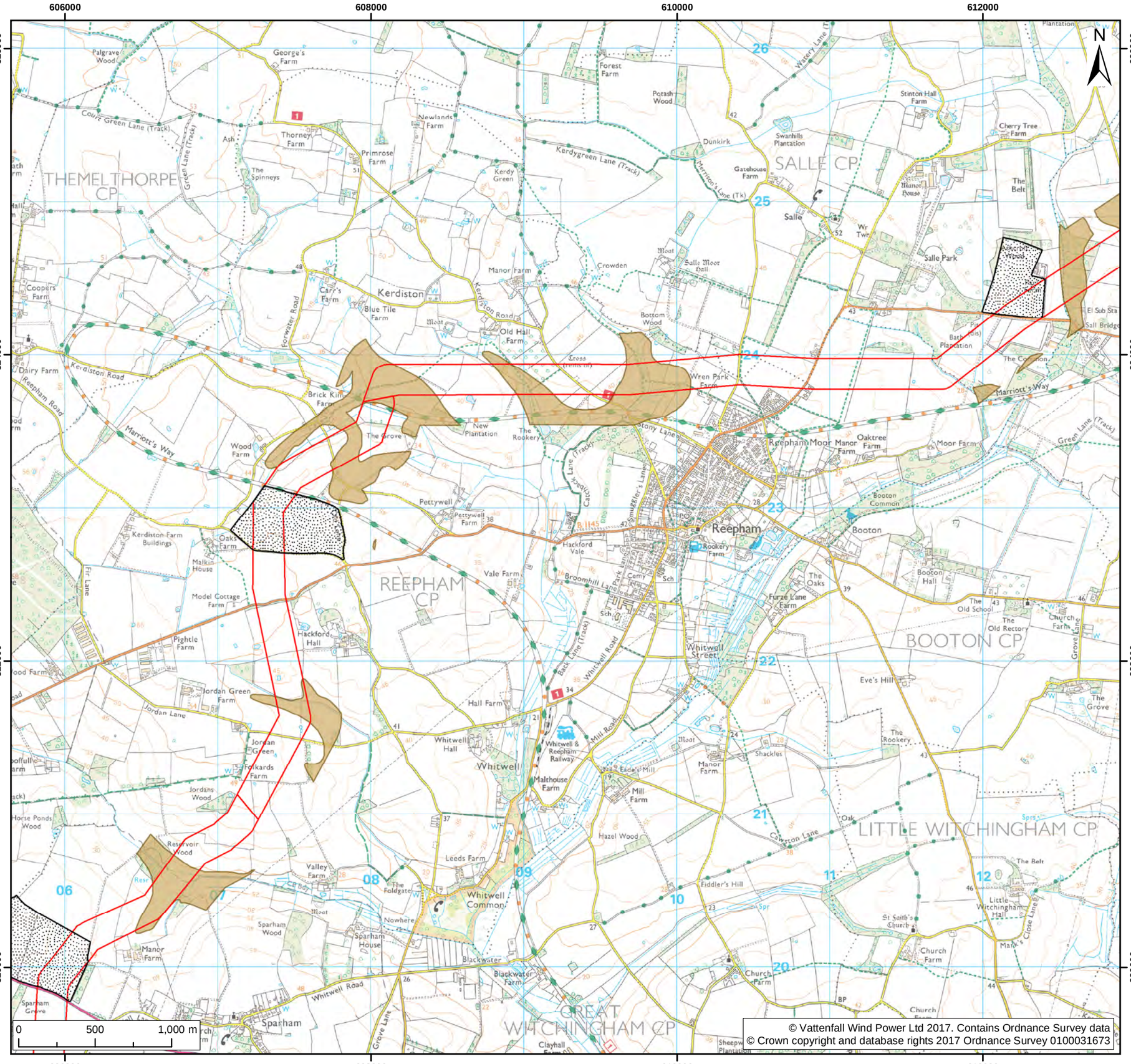

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 6 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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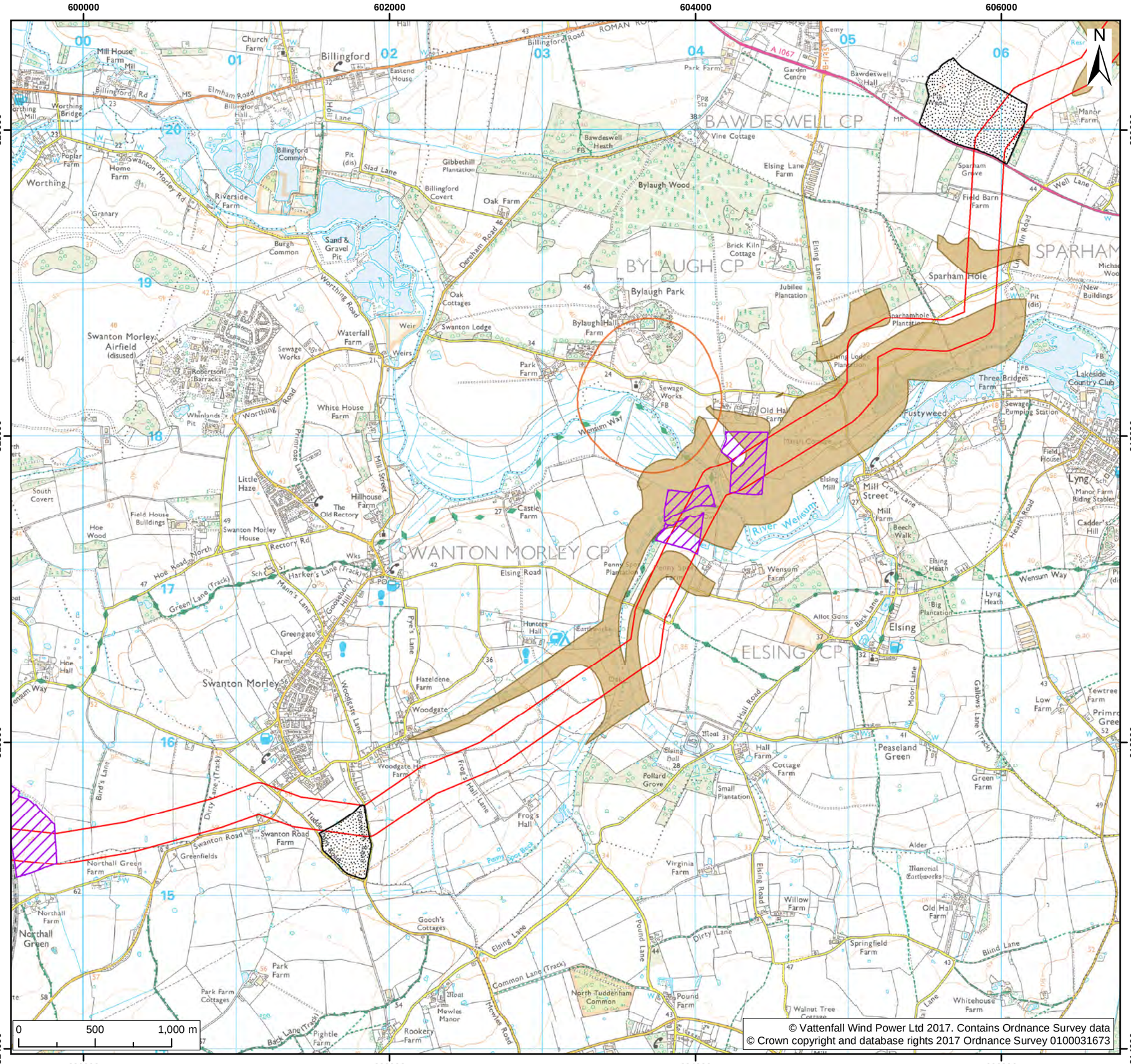

0 500 1,000 m

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone

Mineral and Waste Site[1]

- Wastewater Consultation Area

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 7 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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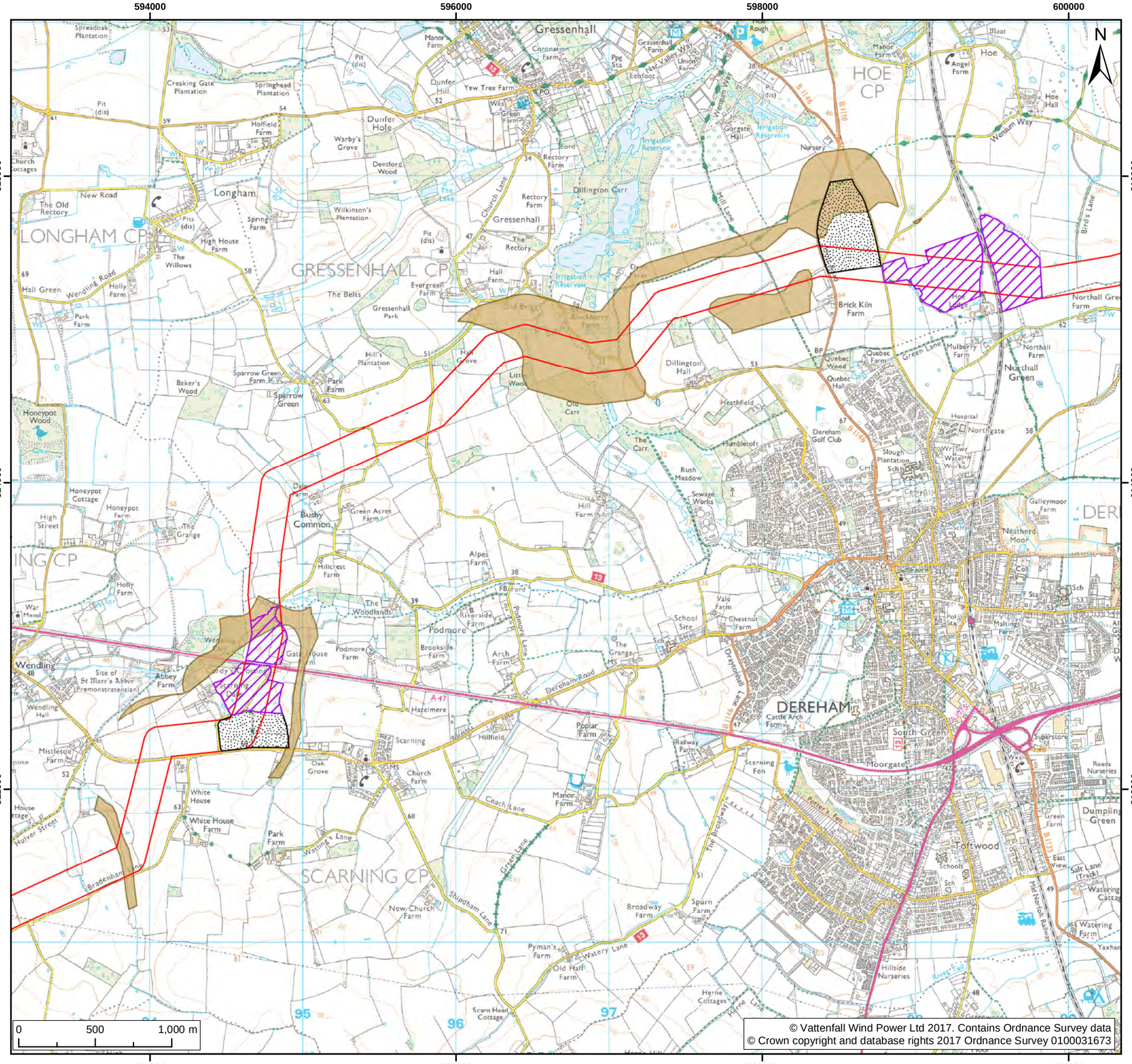

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone

Mineral and Waste Site¹

- Sand and Gravel Safe Guard Zone

¹ NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Mineral Safe Guard Areas (Map 8 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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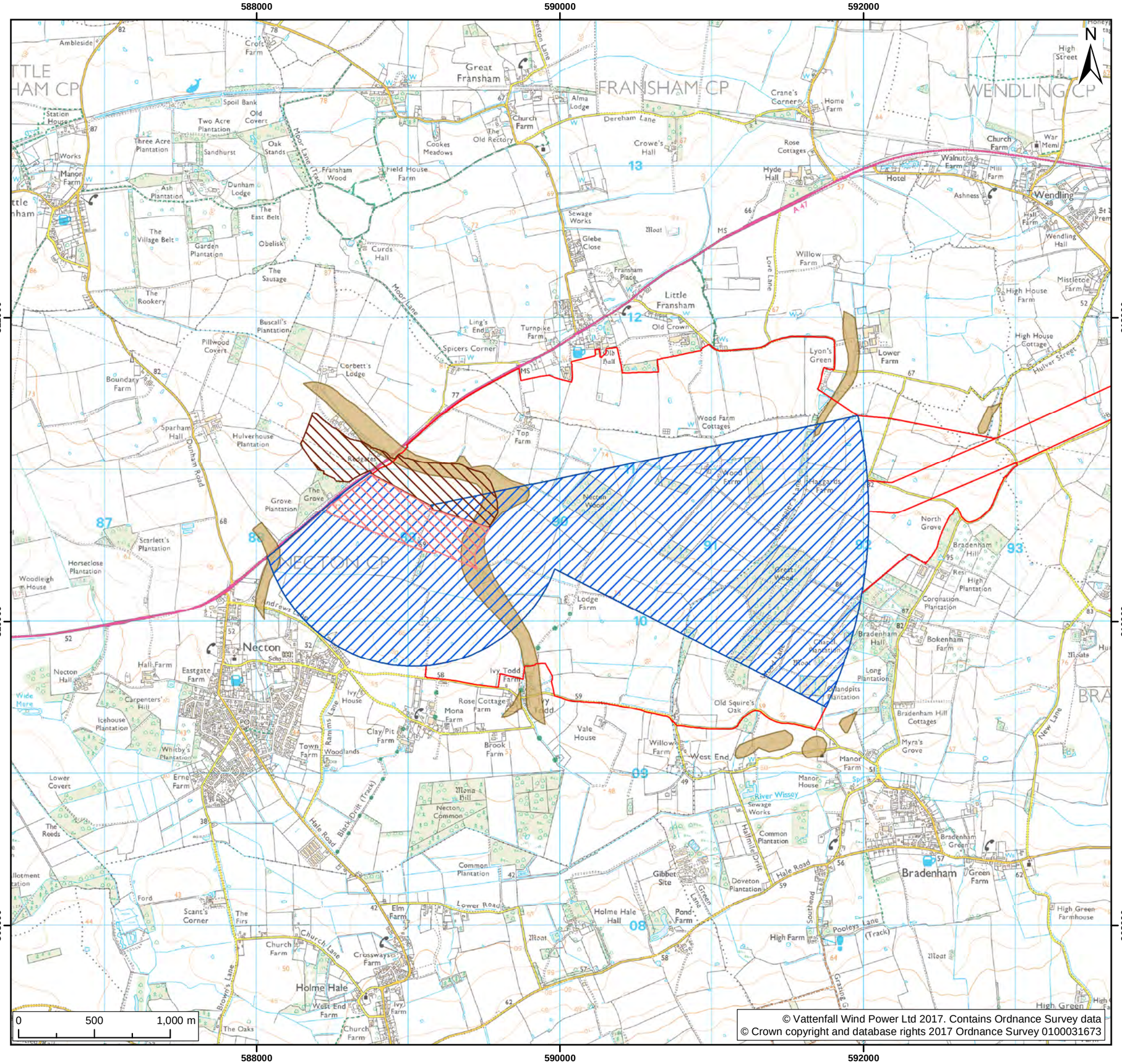

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone

Mineral and Waste Site[1]

- Sand and Gravel Safe Guard Zone

[1] NCC, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Mineral Safe Guard Areas
(Map 9 of 9)

Figure: 19.4 | Drawing No: PB4476-004-0191-004

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:25,000

Co-ordinate system: British National Grid **EPSG:** 27700

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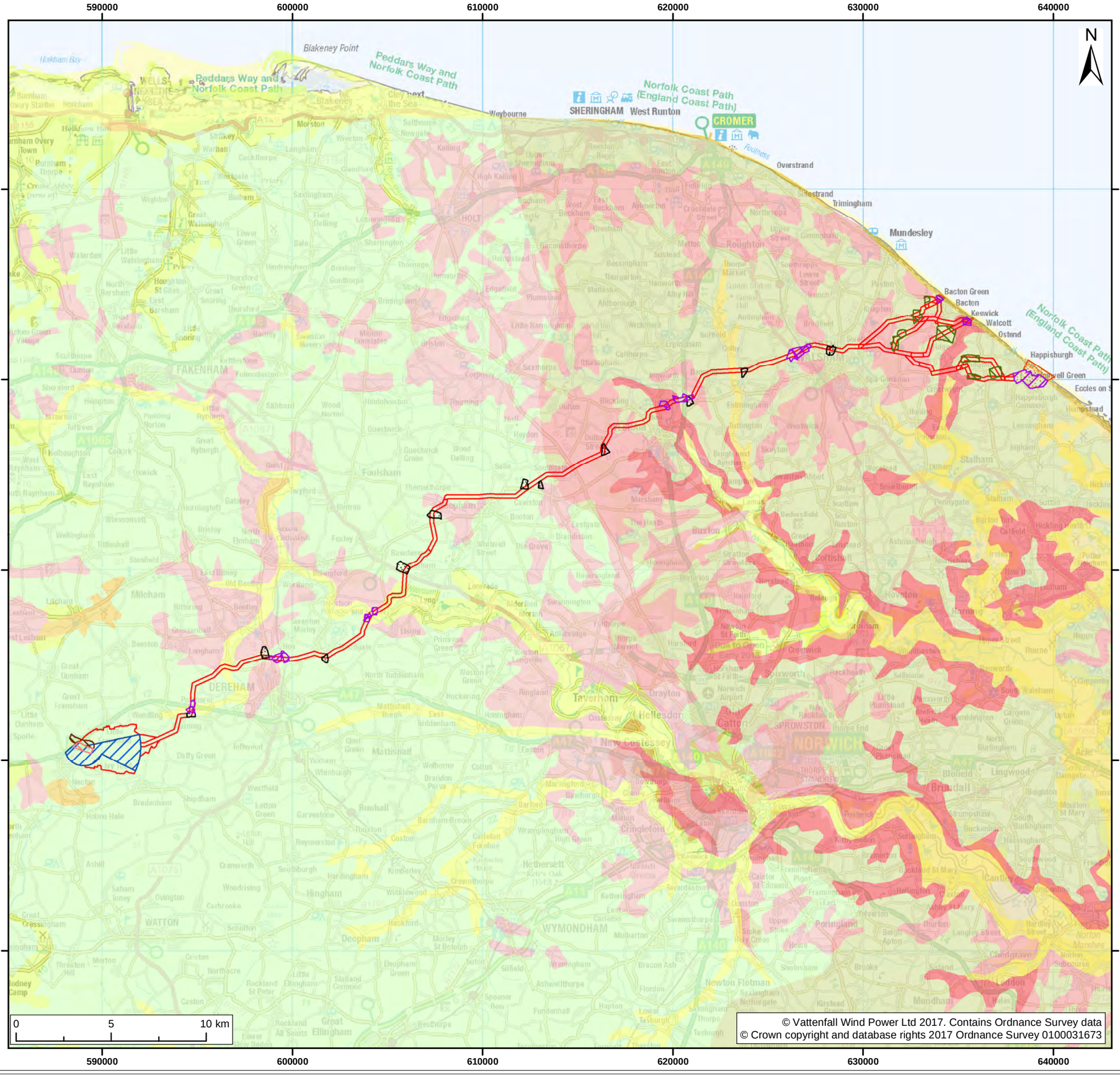

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone

Superficial geology[1]

- Till - Diamicton
- Glacial Sand and Gravel
- Crag group - Sand and Gravel
- Alluvium - Clay, Silt and Sand
- River Terrace deposits - Undifferentiated Sand and Gravel
- Brickearth - Silt

Bedrock Geology[1]

- Neogene to Quaternary Rocks (Undifferentiated) - Gravel, Sand, Silt and Clay
- White Chalk Subgroup - Chalk
- Thames Group - Clay, Silt, Sand and Gravel

[1] British Geological Survey, 2016.

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Superficial and Bedrock Geology

Figure: 19.3 | Drawing No: PB4476-004-0191-003

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	XX	A3	1:200,000

Co-ordinate system: British National Grid **EPSG:** 27700

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638000 639000 640000

331000

330000

329000

N

Happisburgh

Whimpwell Green

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area
- River Network or Water Feature[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map1 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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635000 636000 637000

331000 330000

N

Option 5a

Option 6a & 6b

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map2 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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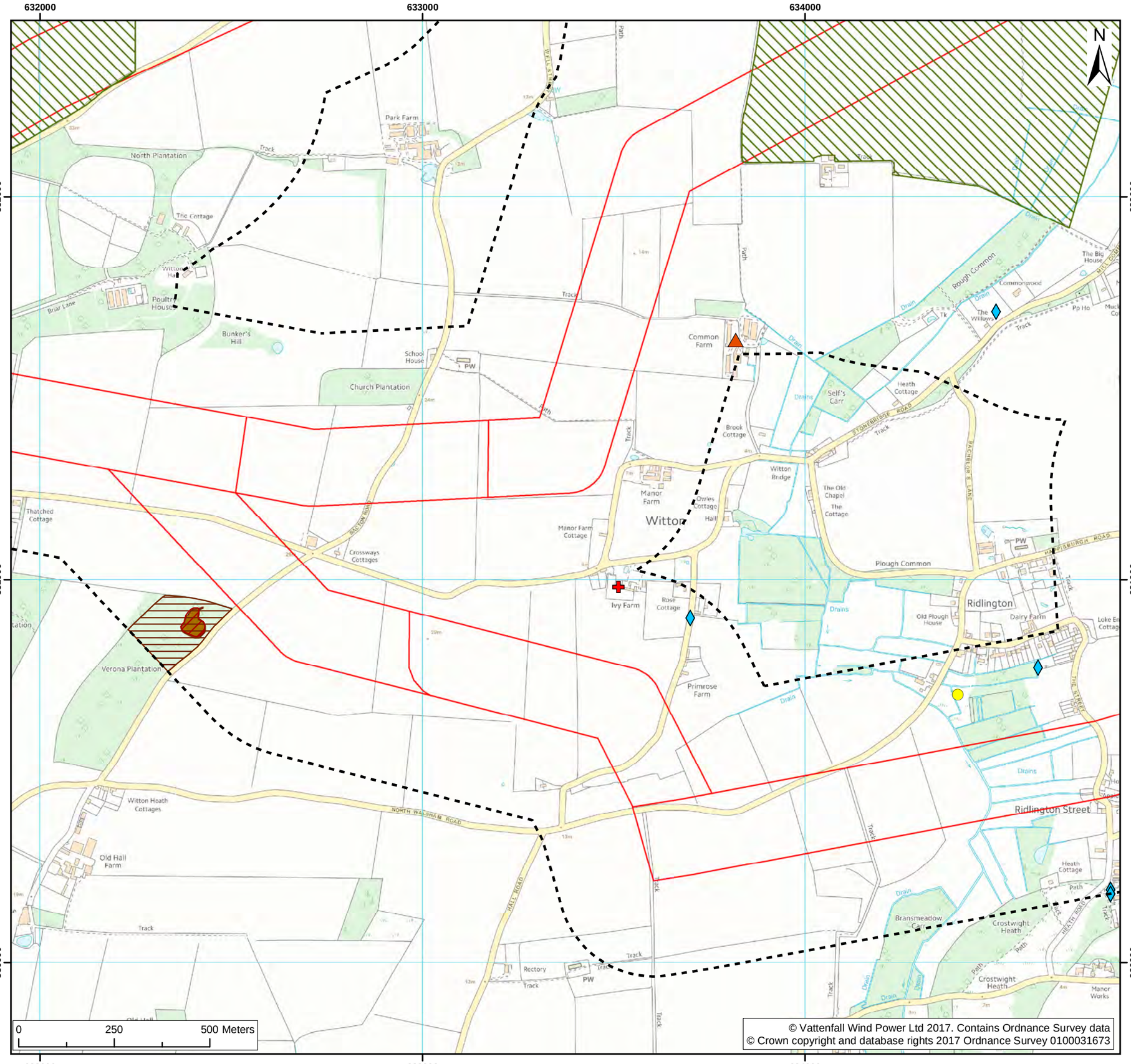

Legend:

Norfolk Vanguard Onshore

- Cable Relay Station Search
- Onshore Cable Corridor
- Study Area
- BGS Recorded Landfill
- Local Authority Recorded Landfill
- EA Historic Landfill[1]
- BGS Recorded Mineral
- Planning Hazardous Substance
- Pollution Incidents[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map3 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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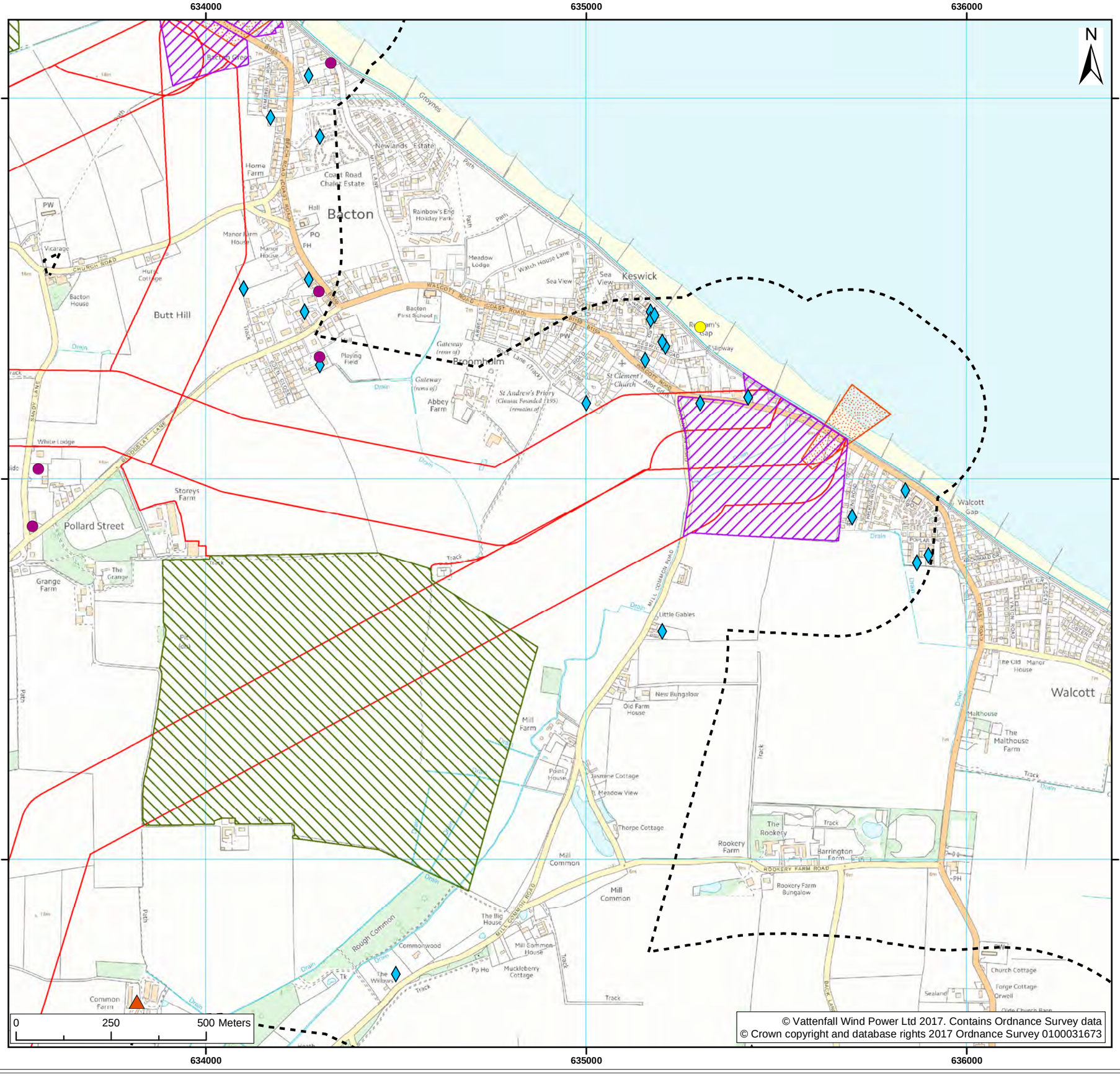

Legend:

Norfolk Vanguard Onshore

- Landfall Zone
- Cable Relay Station Search
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD)
- Study Area
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map4 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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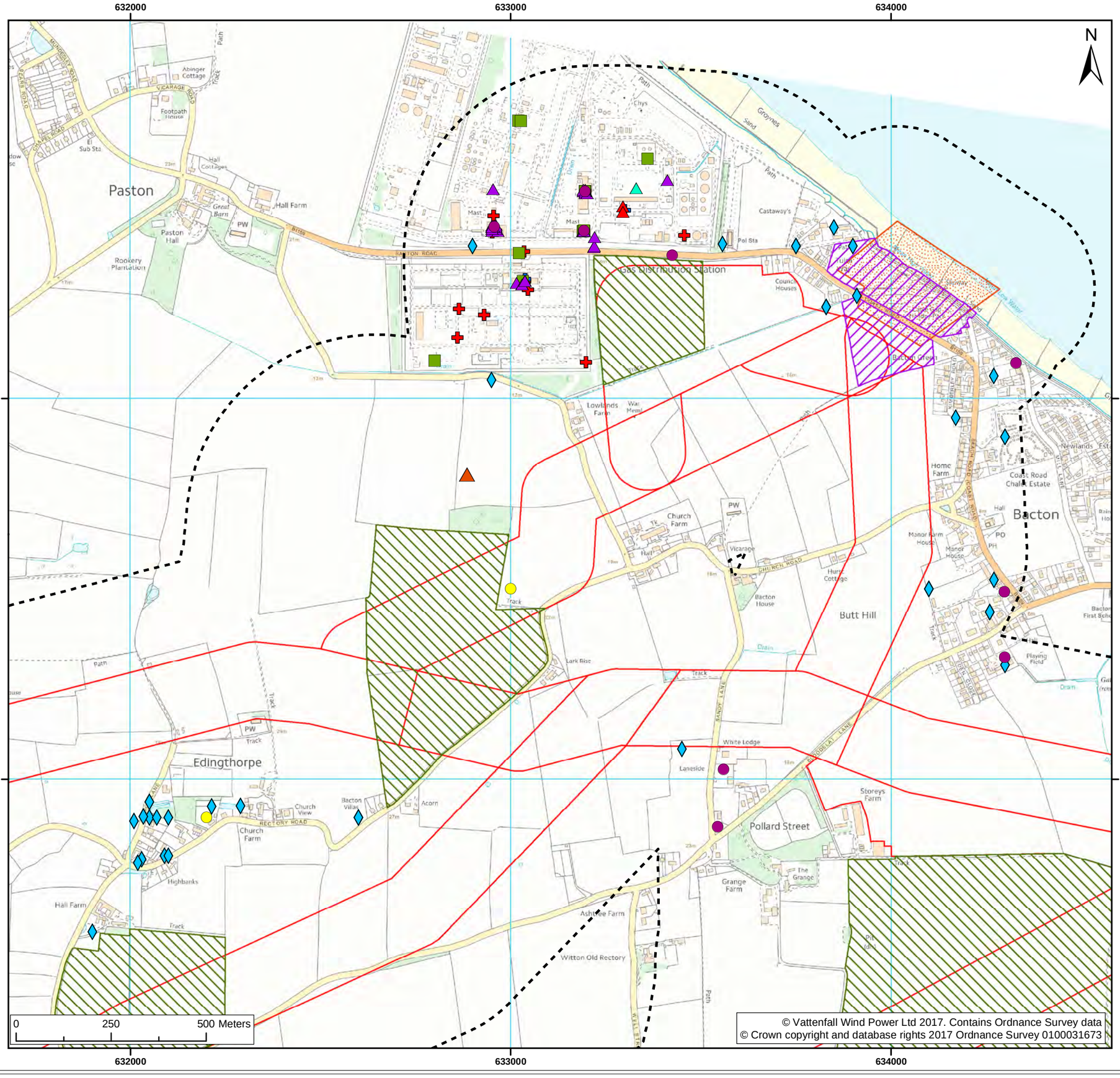

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area
- BGS Recorded Mineral Site[1]
- NIHHS[1]
- Planning Hazardous Substance Consent[1]
- COMAH Sites[1]
- Registered Radioactive Substances[1]
- Pollution Incidents[1]
- Local Authority Integrated Pollution Prevention and Control[1]
- Intergrated Pollution Control[1]
- Integrated Pollution Prevention Control[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map5 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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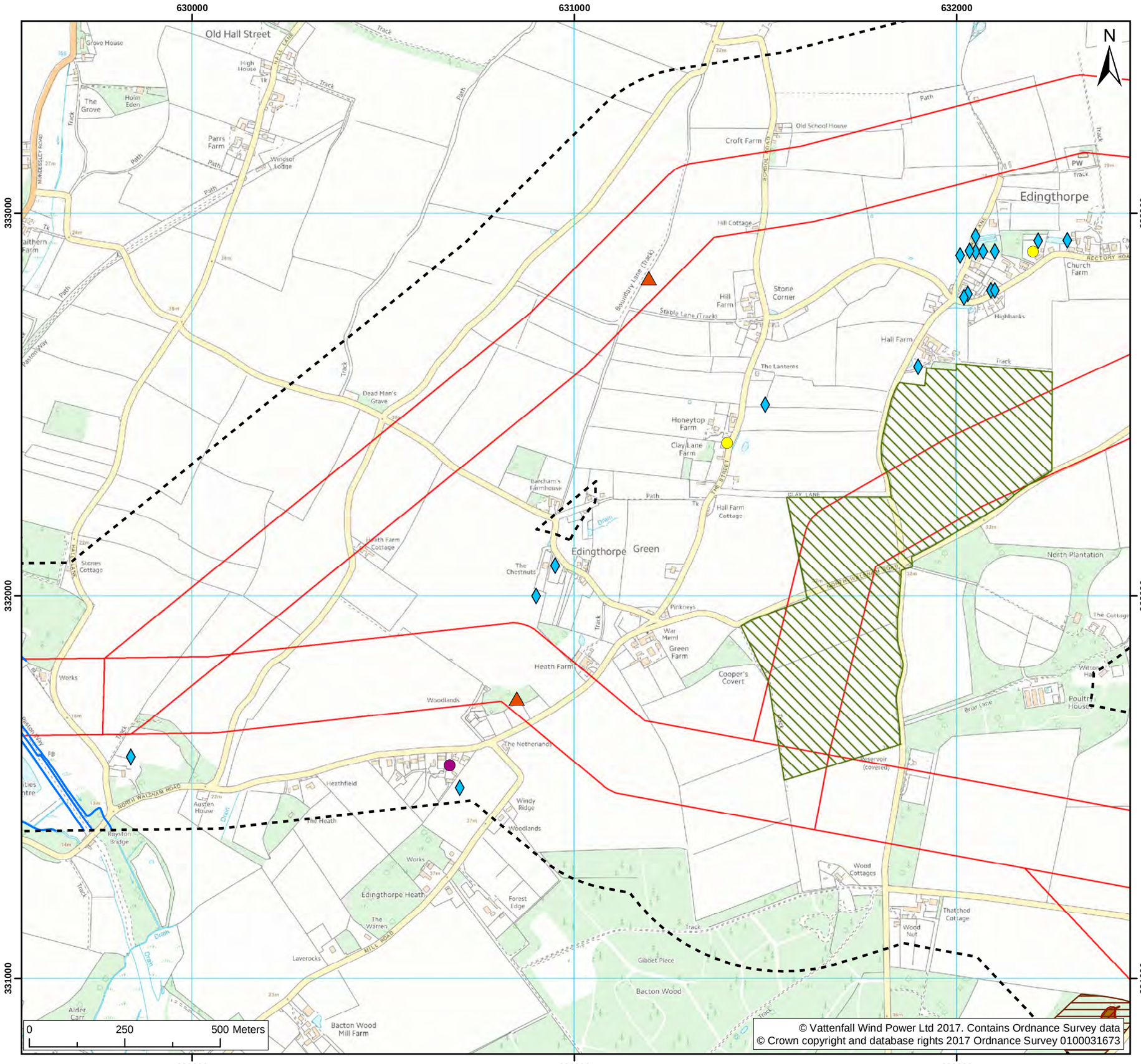

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Landfill Site[1]
- Local Authority Recorded Landfill
- EA Historic Landfill[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map6 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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627000 628000 629000

332000 331000 330000

N

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Registered Waste Transfer Site[1]
- Registered Waste Treatment Site[1]
- Licensed Waste Management Facility[1]
- Pollution Incidents[1]
- Local Authority Integrated Pollution Prevention and Control[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map7 of 25)

Figure: 19.2 Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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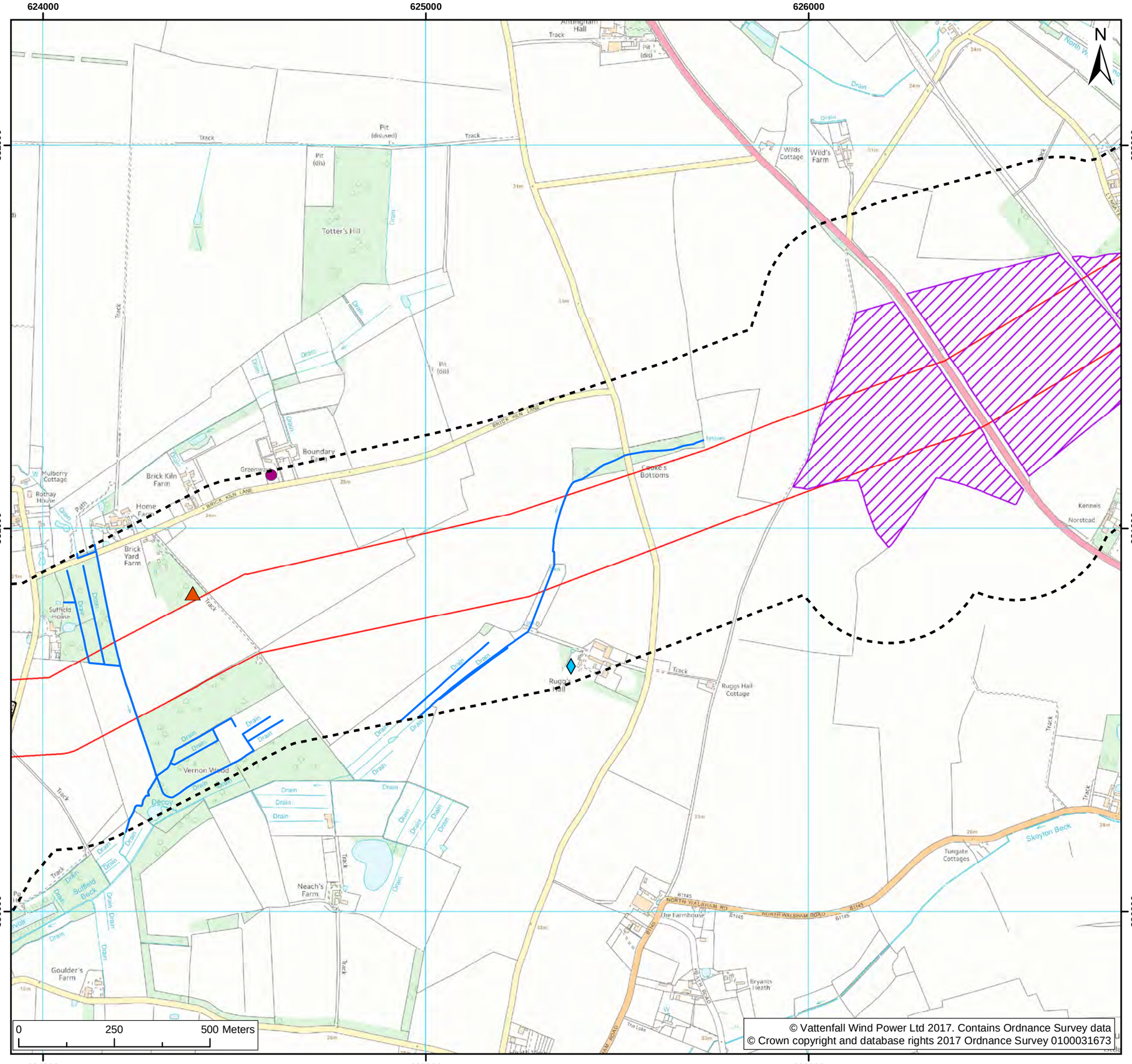

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map8 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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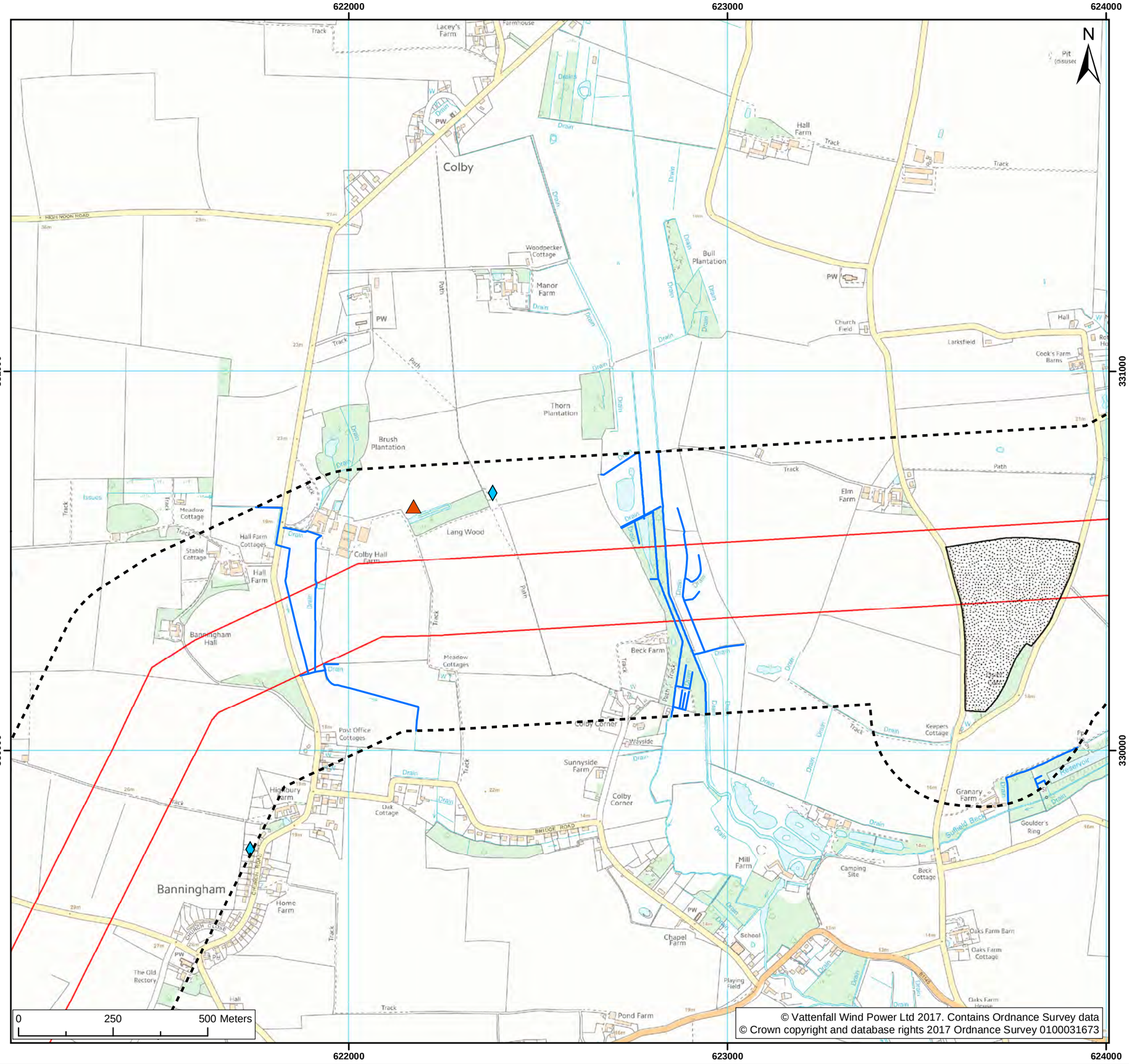

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map9 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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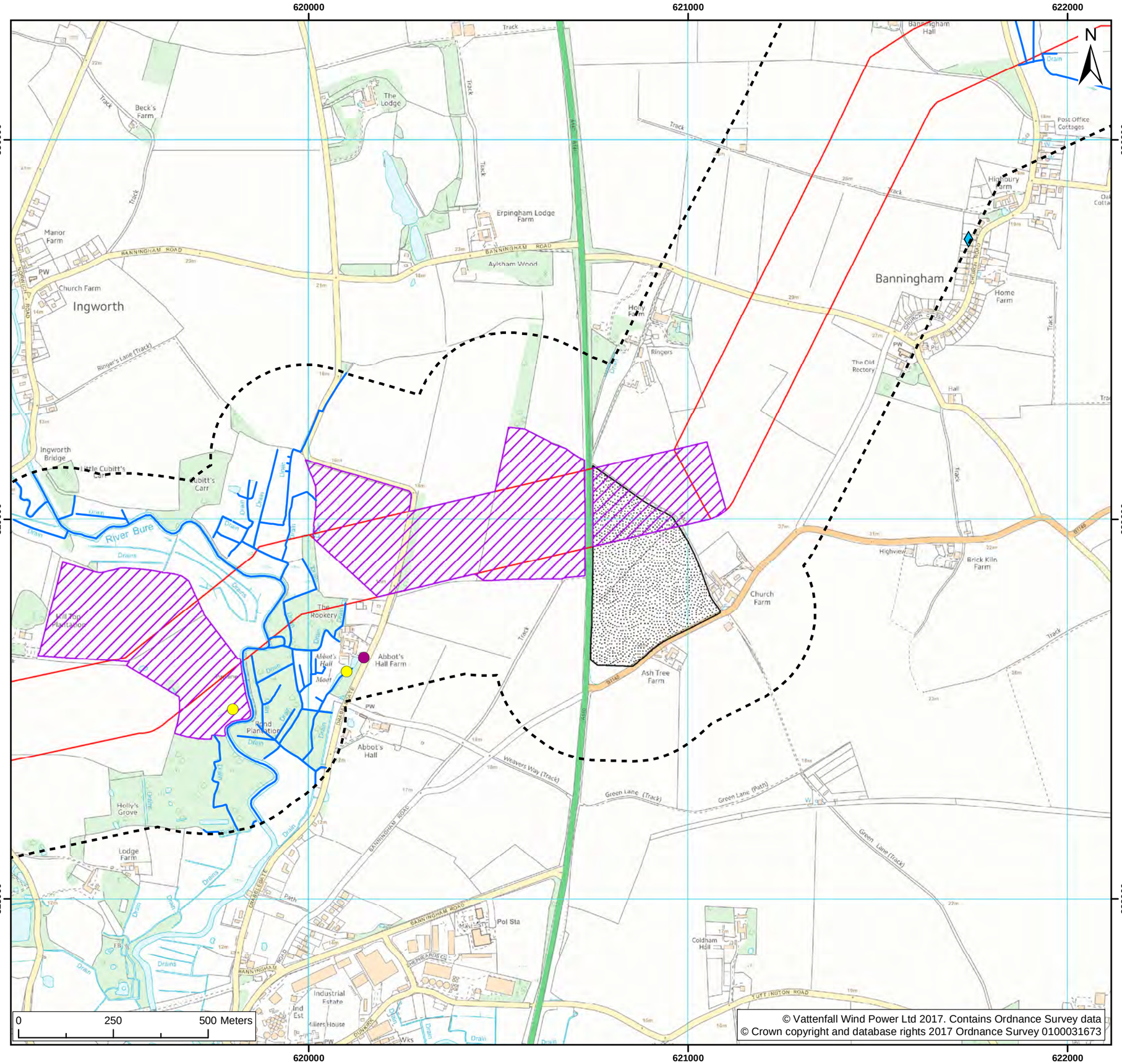

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map10 of 25)

Figure:	Drawing No:
19.2	PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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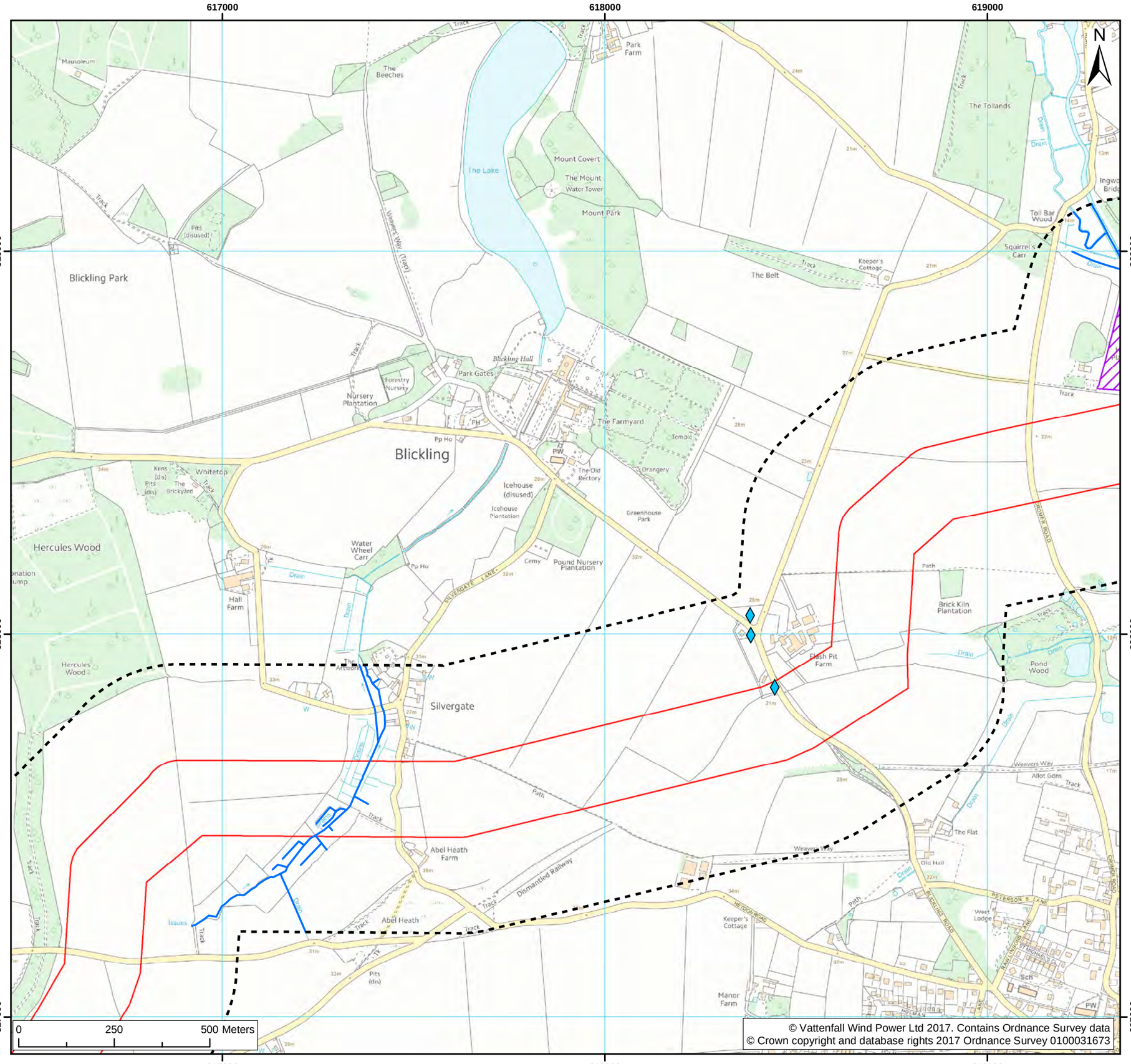

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area
- River Network or Water Feature[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map11 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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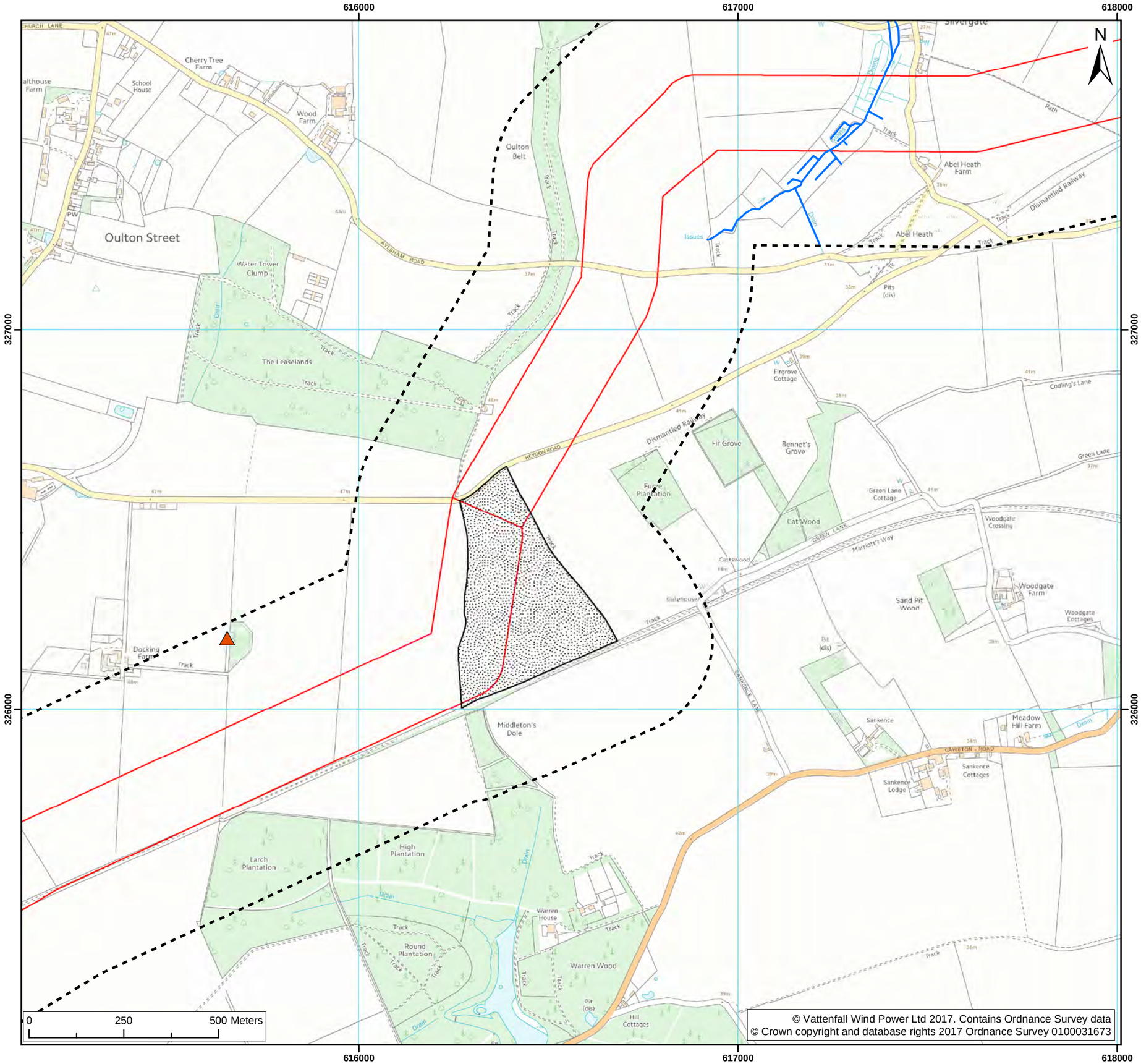

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map12 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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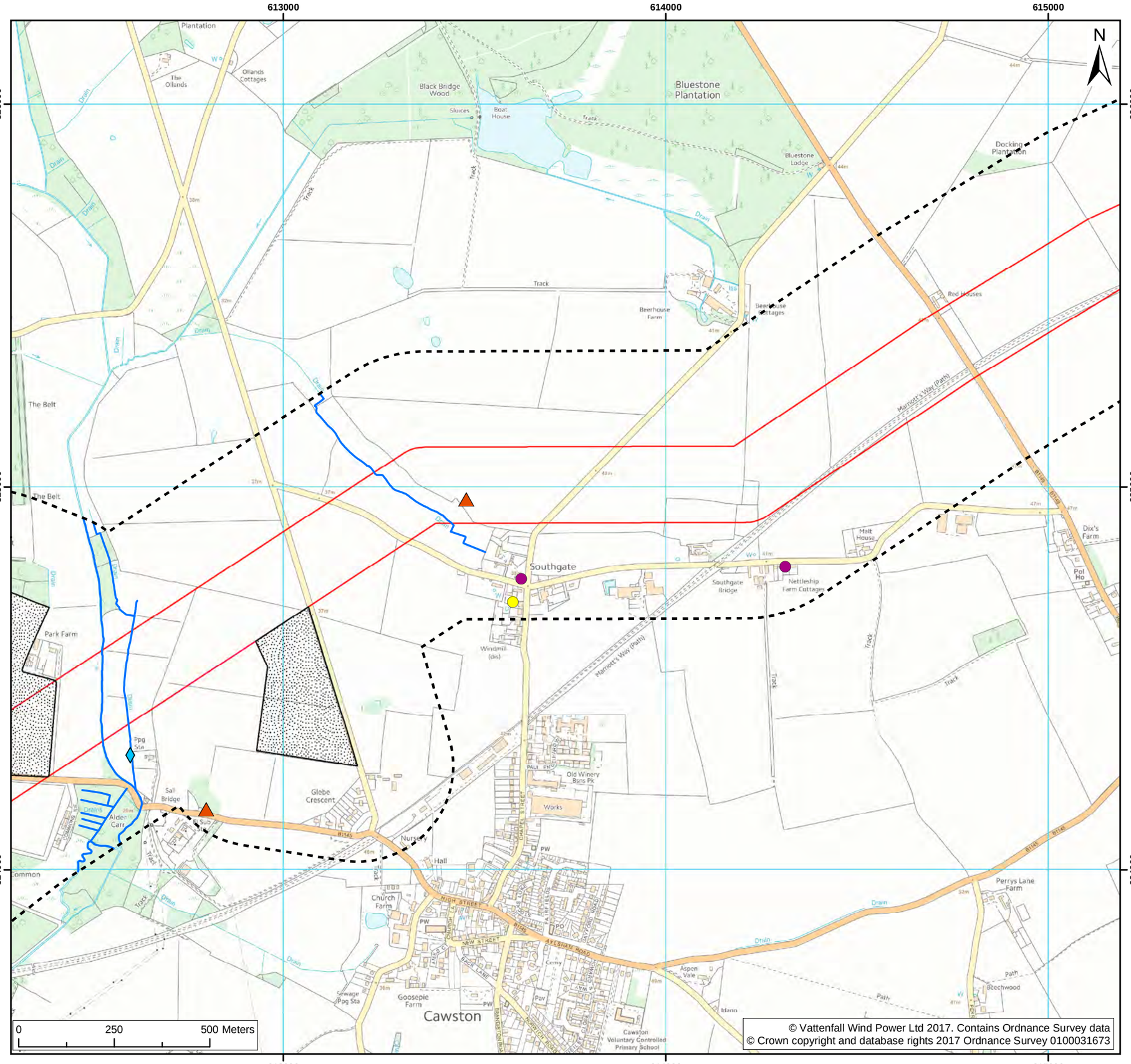

Legend:

Norfolk Vanguard Onshore

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water
- BGS Recorded Mineral
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map13 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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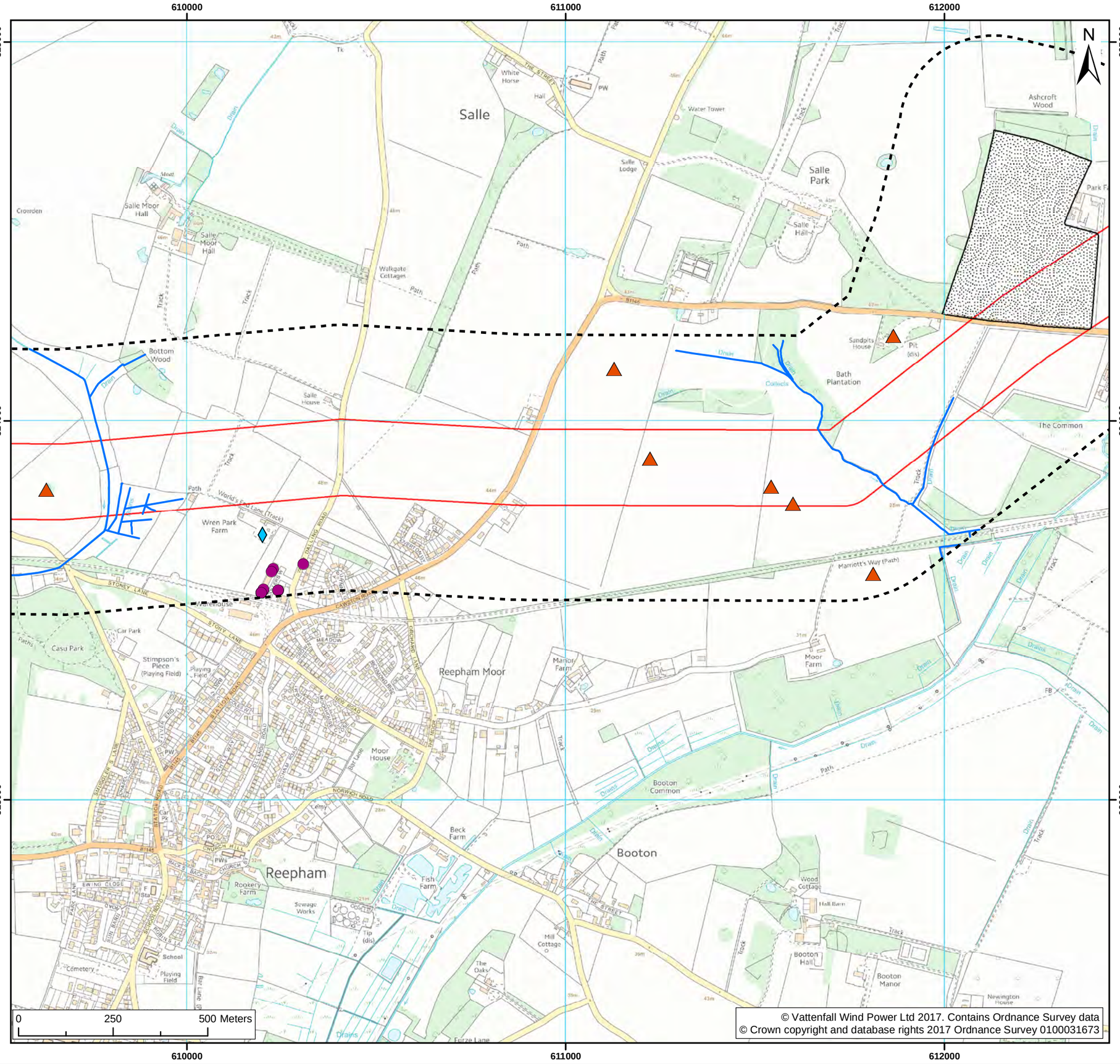

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map14 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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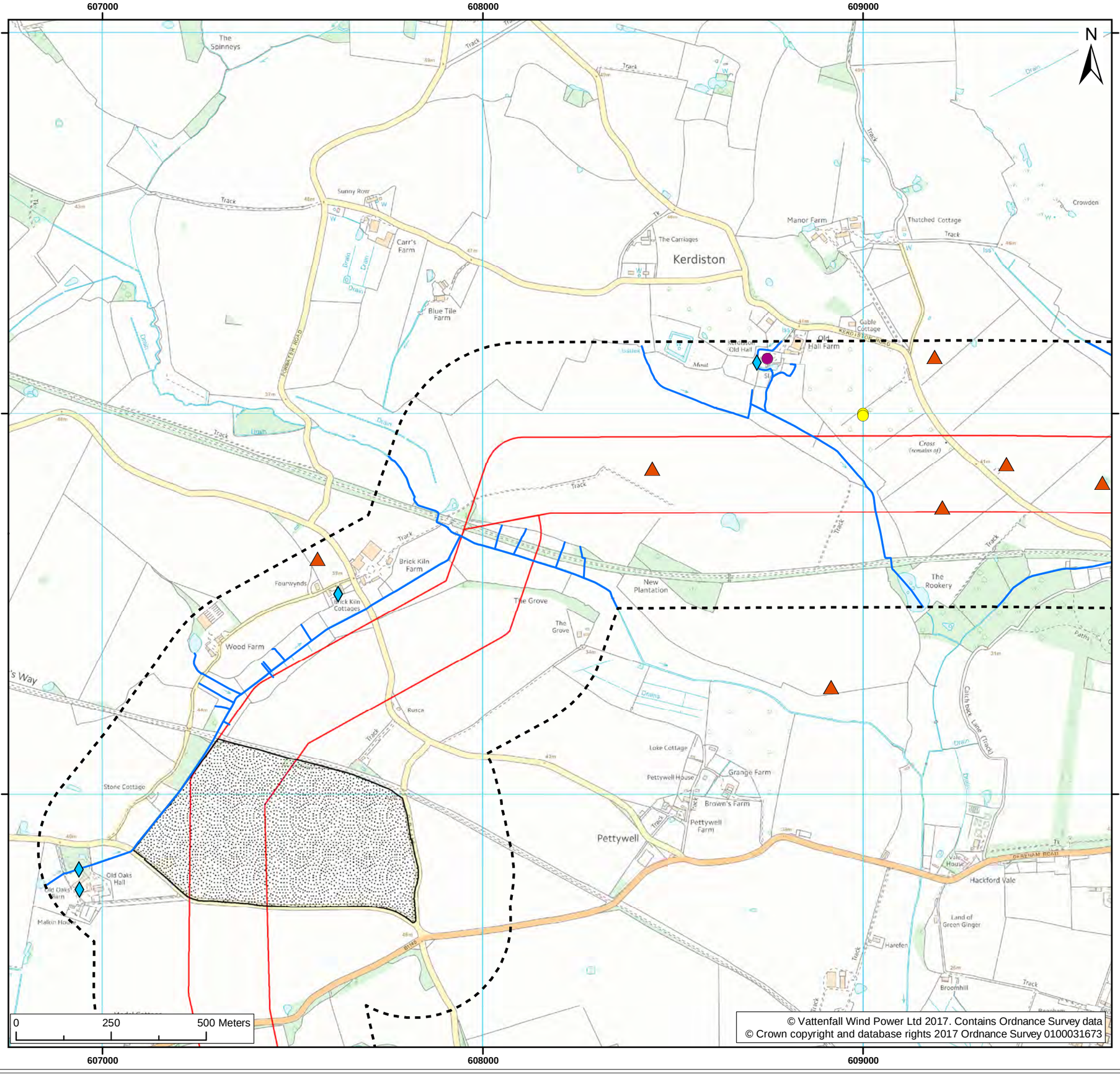

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map15 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	26/04/2018	NJ	MW	A3	1:10,000
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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606000
607000
322000
321000
N
0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map16 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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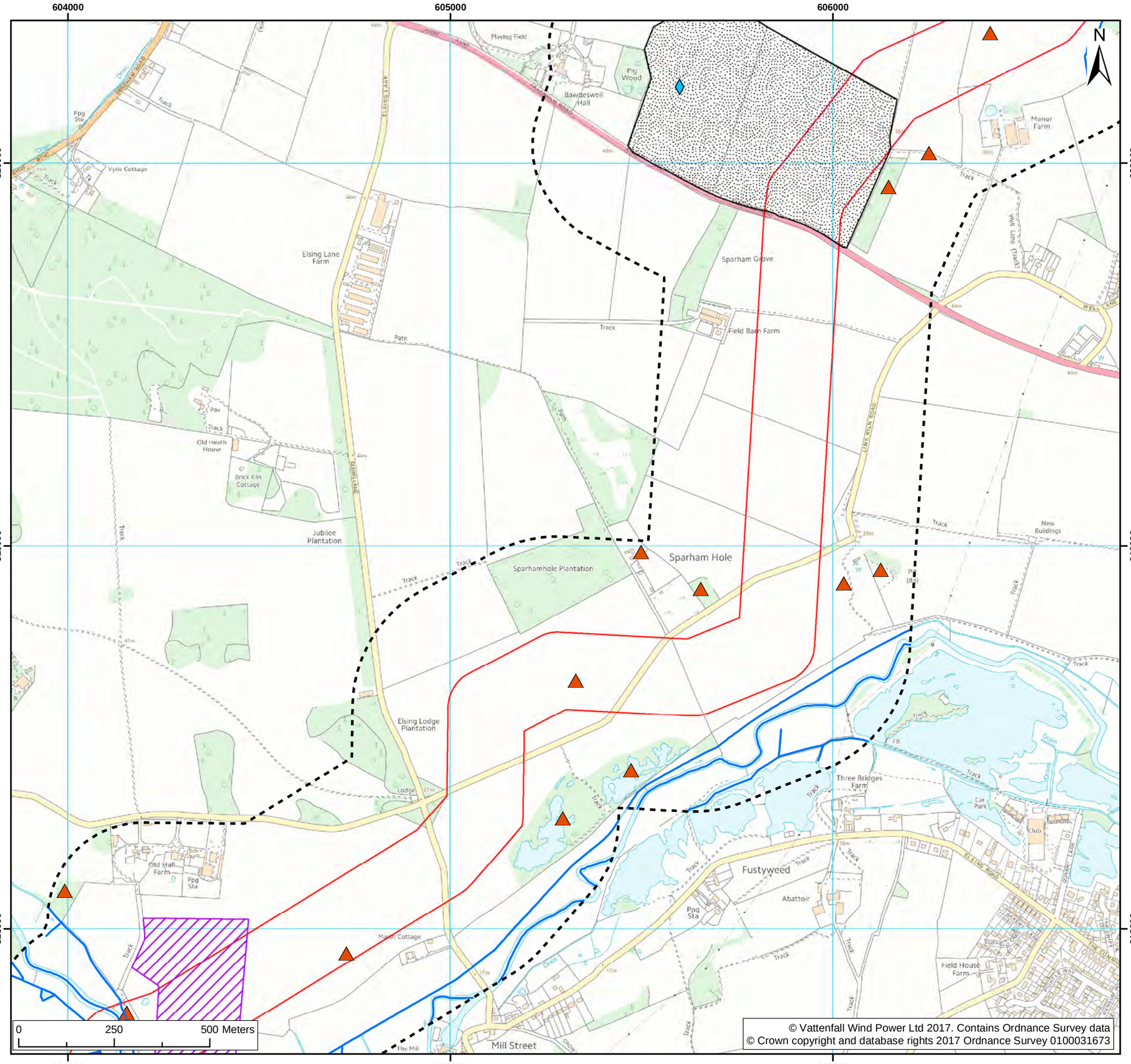

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map17 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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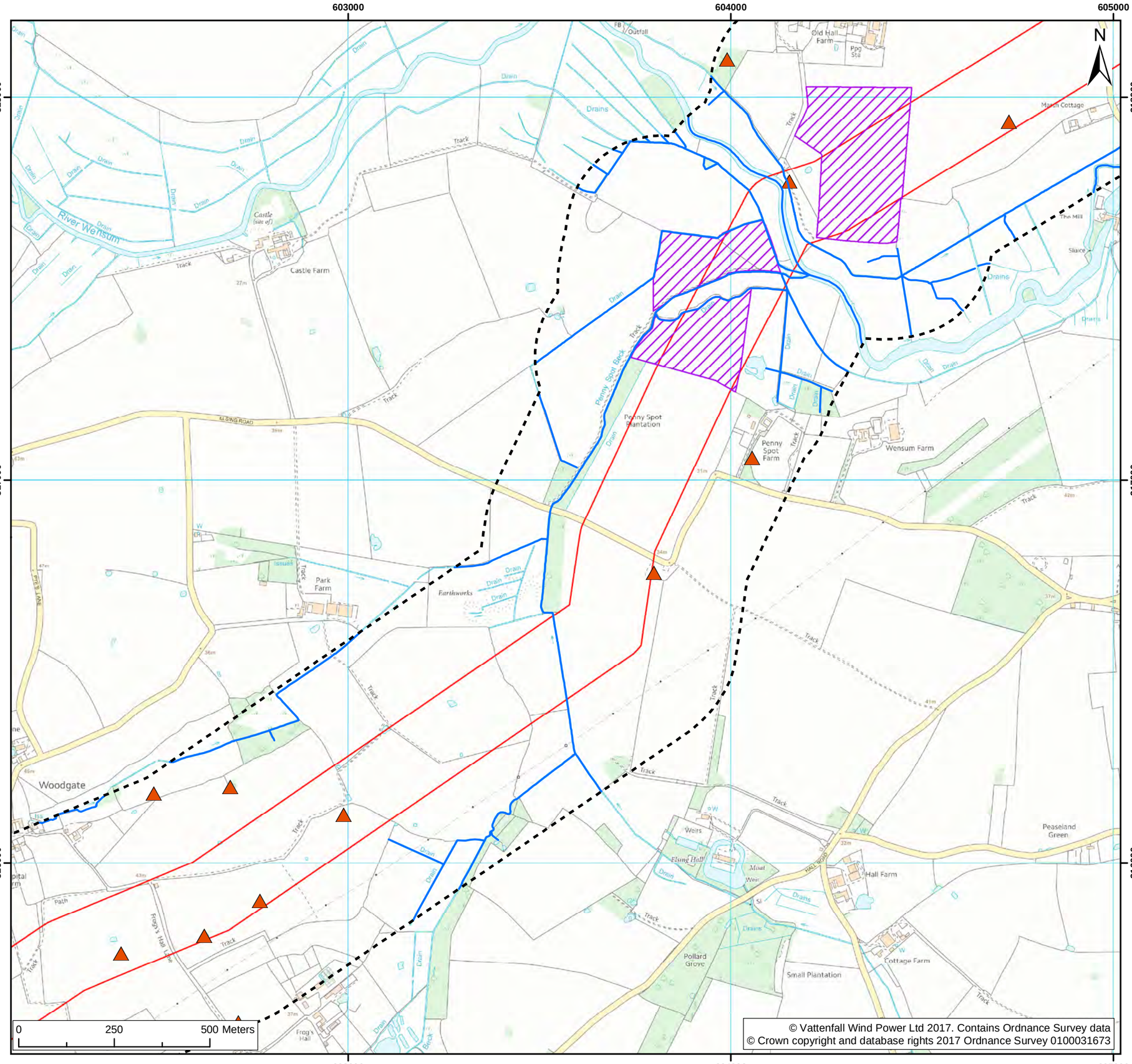

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map18 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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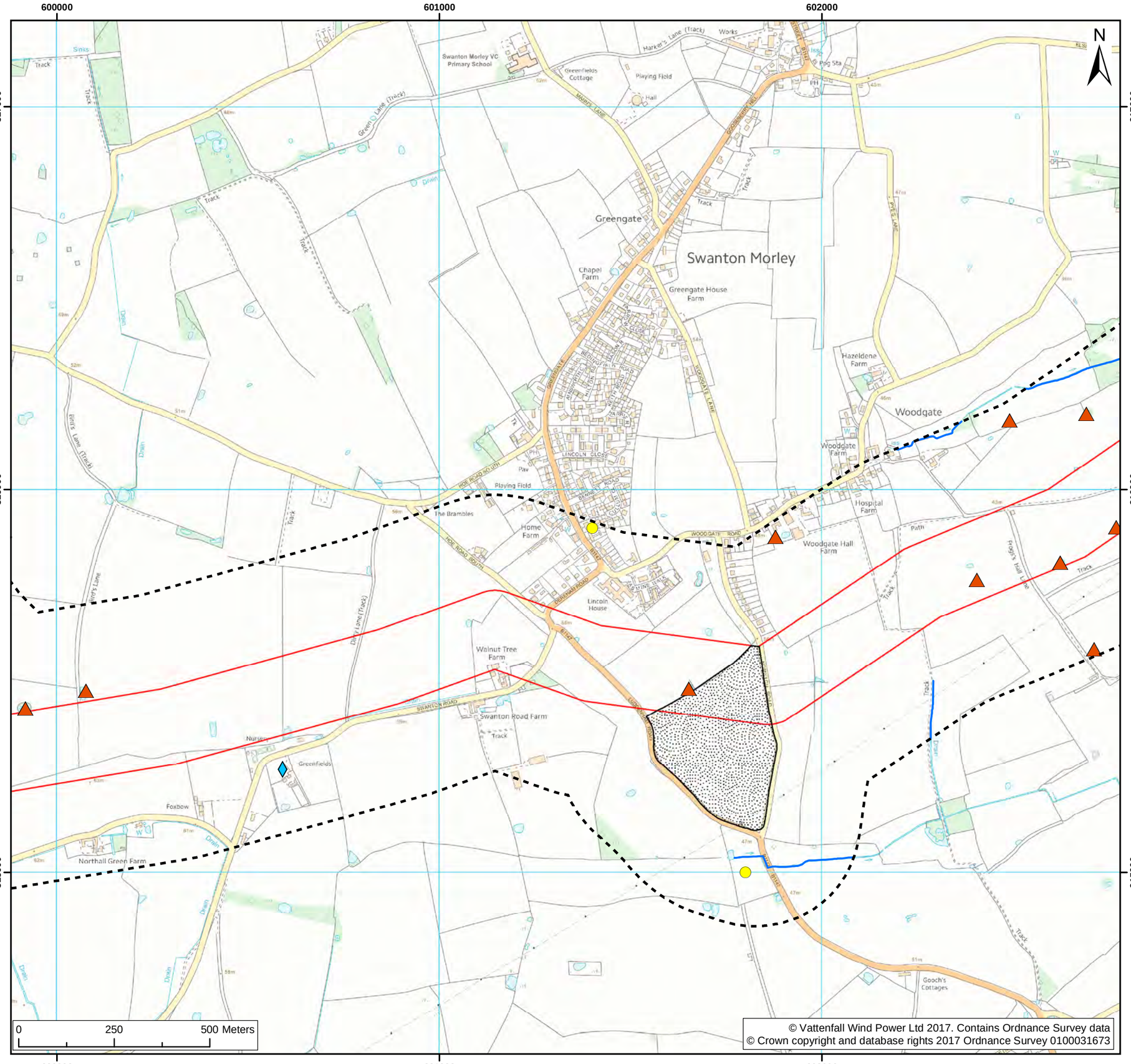

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map19 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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598000

599000

316000

315000

N

Legend:

Norfolk Vanguard Onshore

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD)
- Mobilisation Zone
- Study Area
- River Network or Water
- BGS Recorded Mineral
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map20 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

0 250 500 Meters

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595000 596000 597000

315000 314000 313000

N

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map21 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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Royal HaskoningDHV
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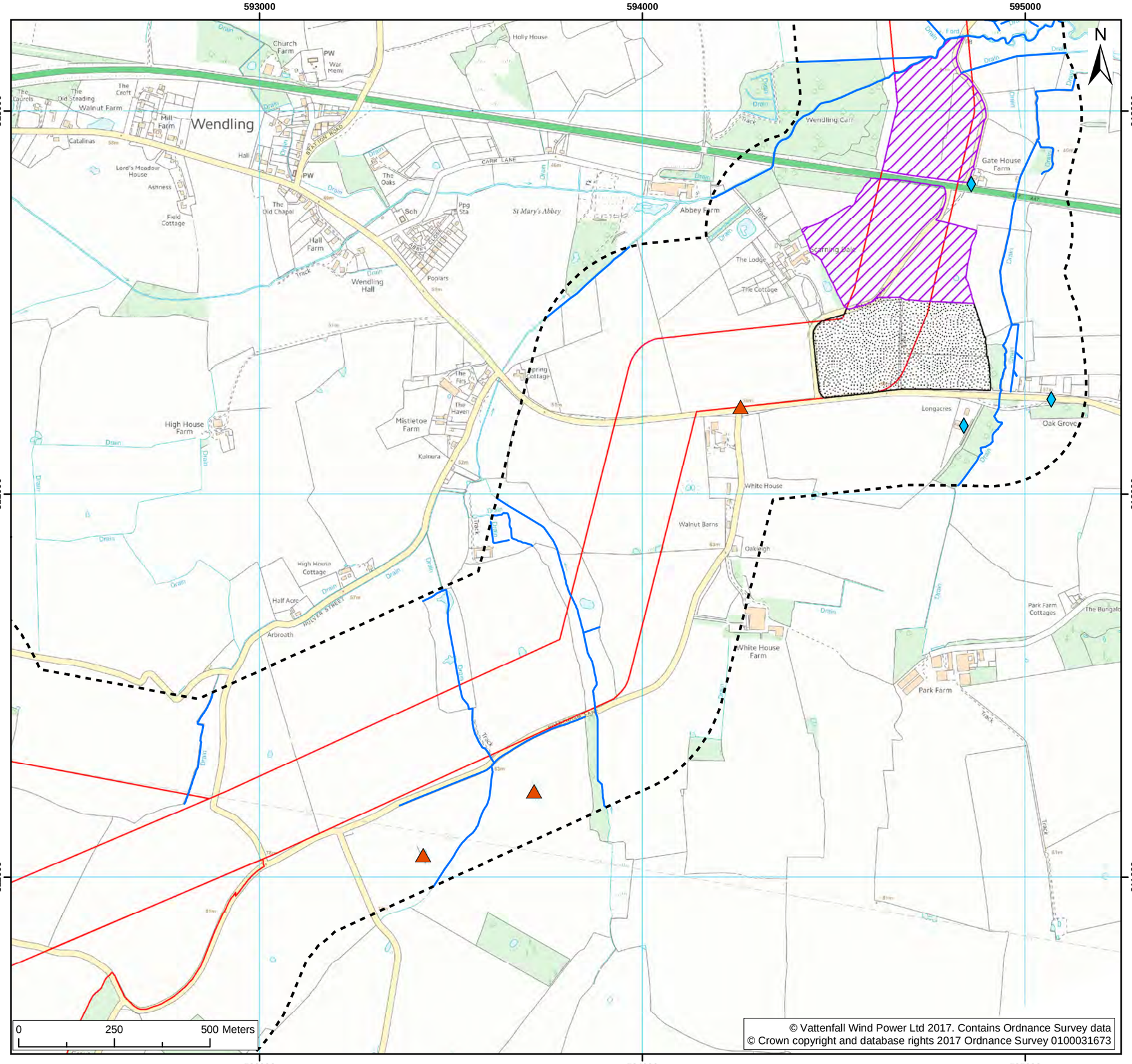

Legend:

Norfolk Vanguard Onshore

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD)
- Mobilisation Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Discharge Consents[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Site Sensitivity (Map22 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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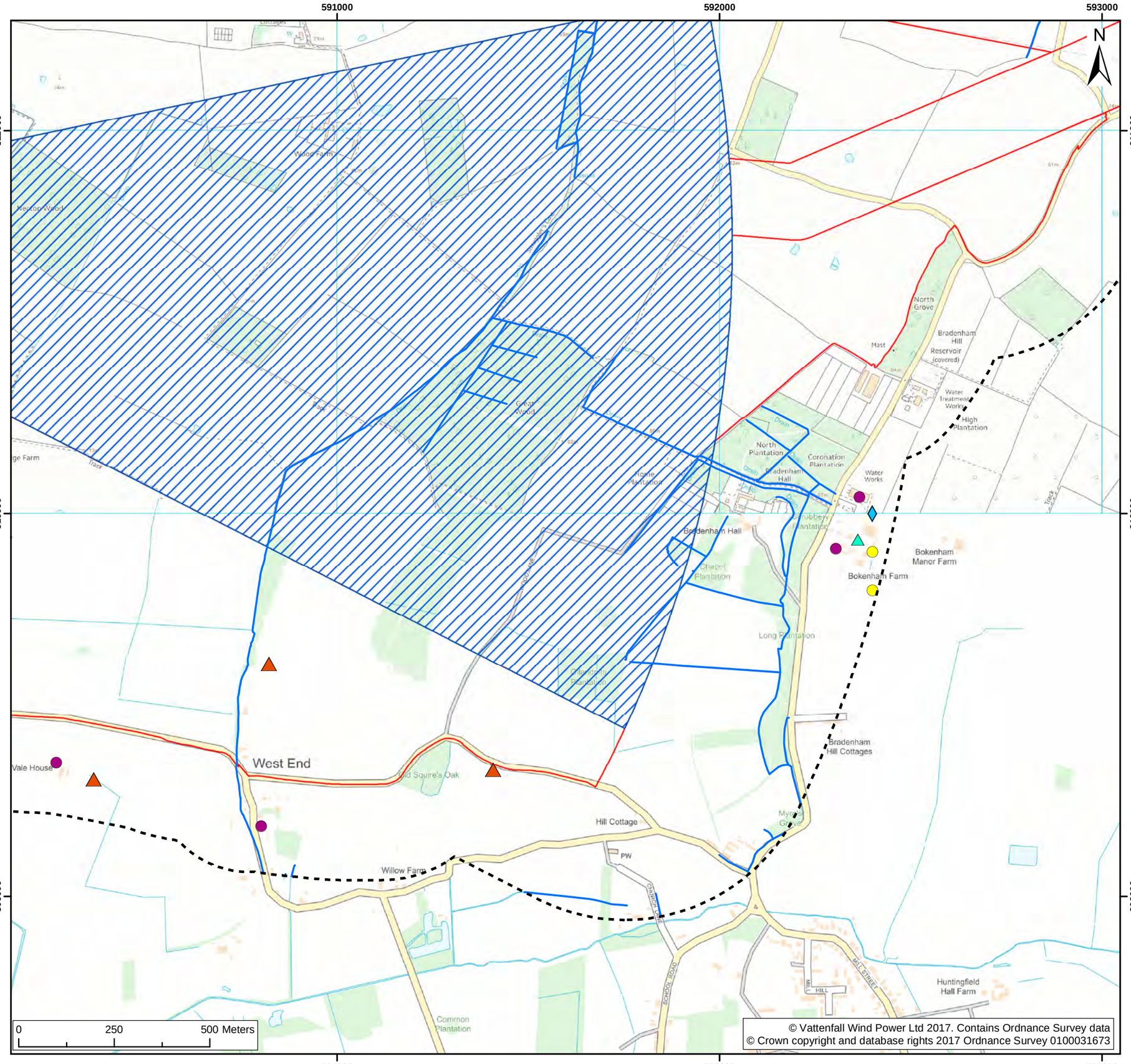

Legend:

Norfolk Vanguard Onshore

- Onshore Cable Corridor
- Project Substation Search Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Local Authority Integrated Pollution Prevention and Control[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map23 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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590000 591000 592000

312000

311000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Pollution Incidents[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map24 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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0 250 500 Meters

588000 589000 590000

311000 310000

N

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area
- River Network or Water Feature[1]
- BGS Recorded Mineral Site[1]
- Local Authority Integrated Pollution Prevention and Control[1]
- Discharge Consents[1]
- Trade Directories[1]

[1] EnviroCheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Site Sensitivity
(Map25 of 25)

Figure: 19.2 | Drawing No: PB4476-004-0191-002

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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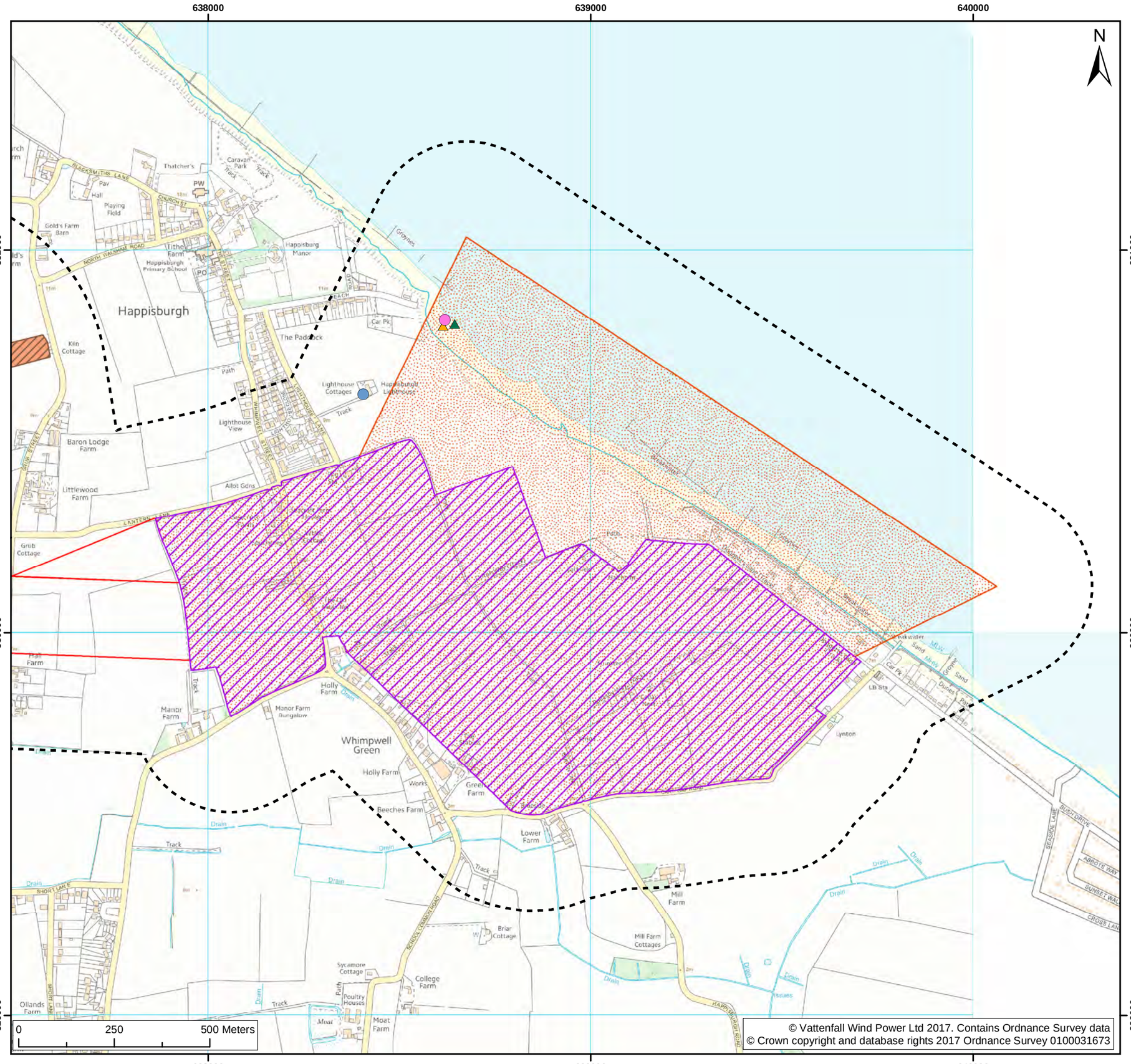

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electrical Sub Station Facilities
- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]
- Electricity production & distribution [inc large transformers]
- Oil, petroleum & gas refining & storage

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 1 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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635000 636000 637000

331000 330000

N

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Historical Tanks and Energy Facilities[1]

- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Clay bricks & tiles [manufacture]
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 2 of 25)

Figure: 19.1 Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

VATTENFALL

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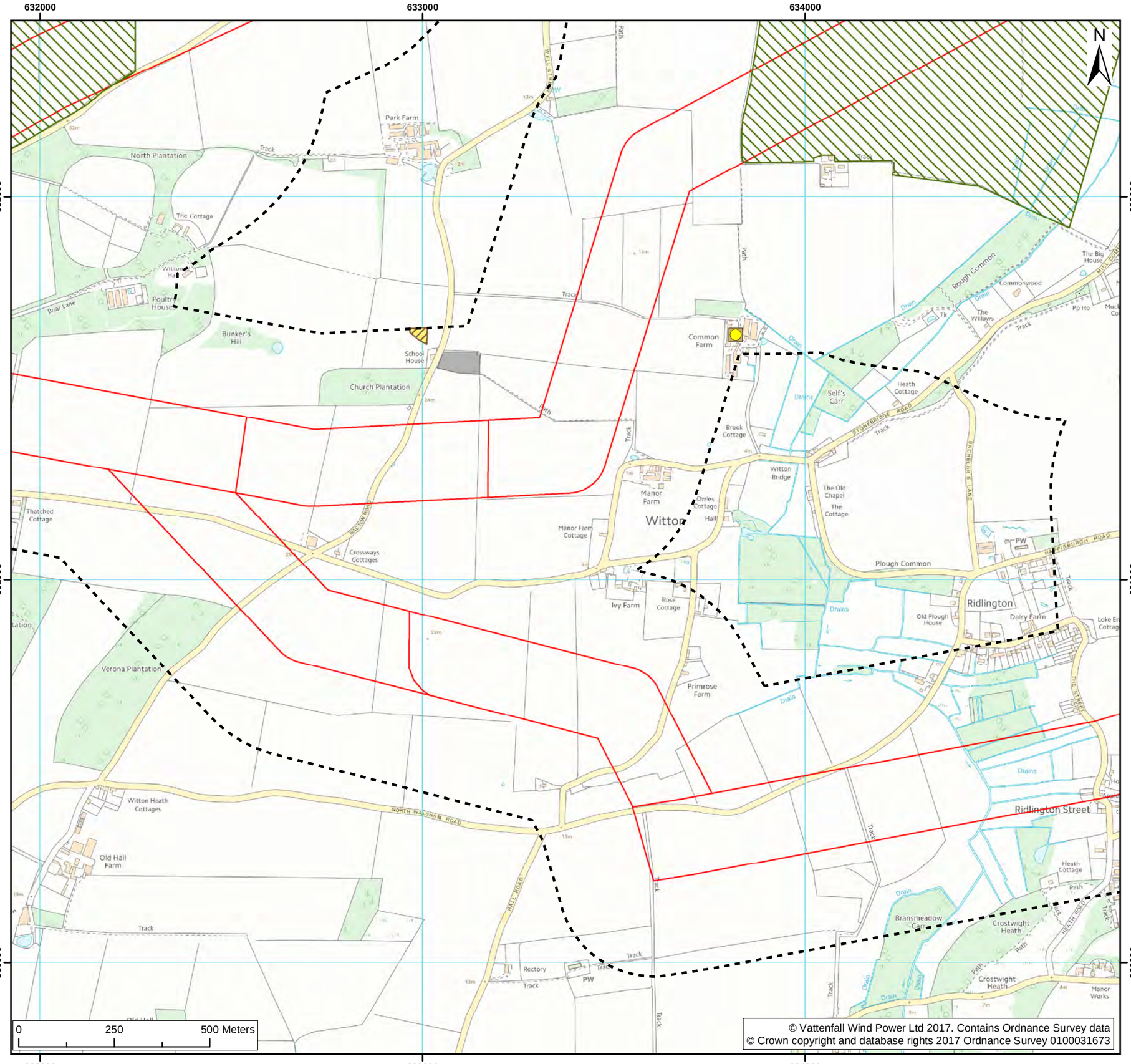

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Quarrying of sand & clay, operation of sand & gravel pits
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 3 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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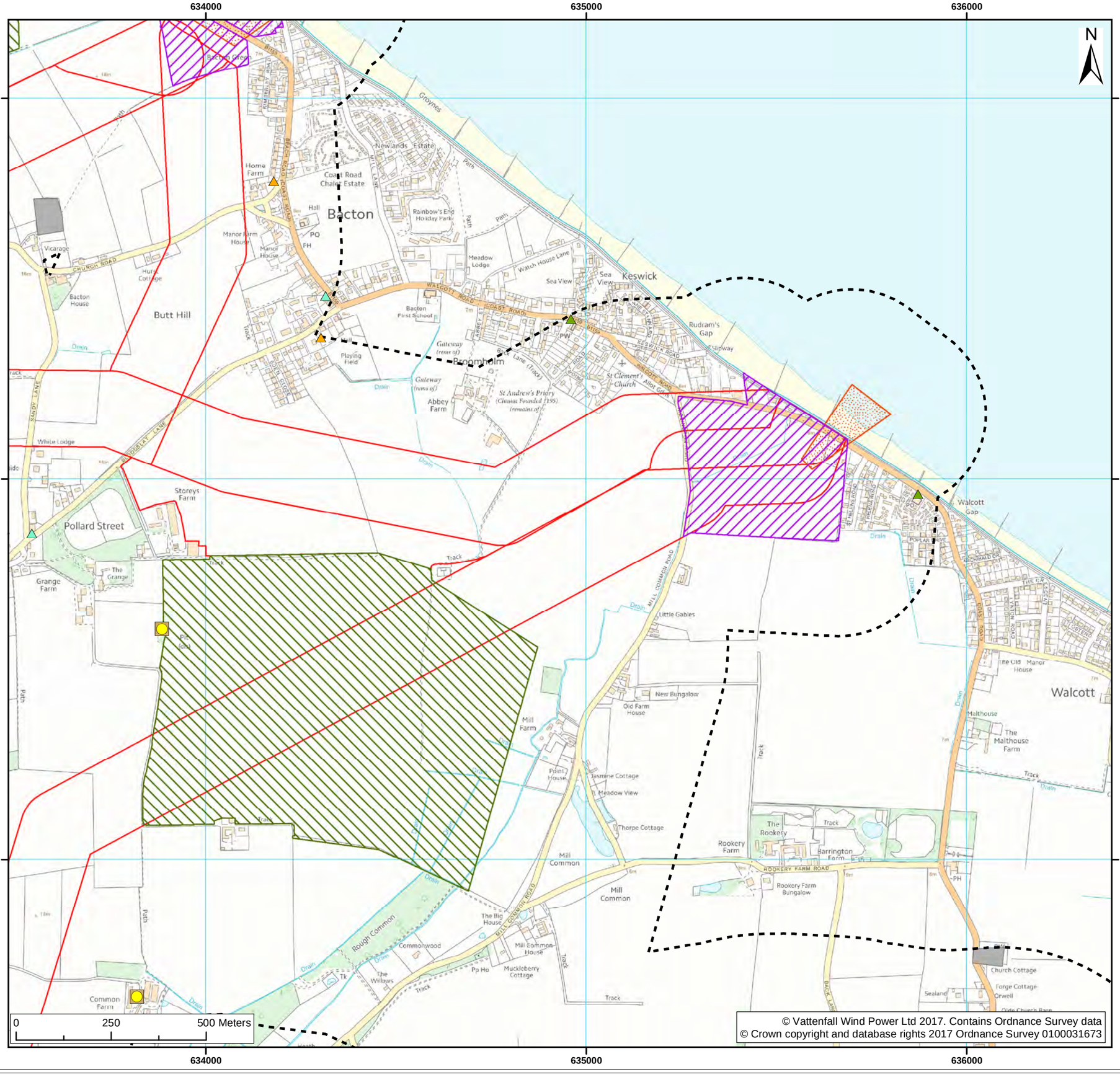

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electrical Sub Station Facilities
- Petroleum Storage Facilities
- Potential Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 4 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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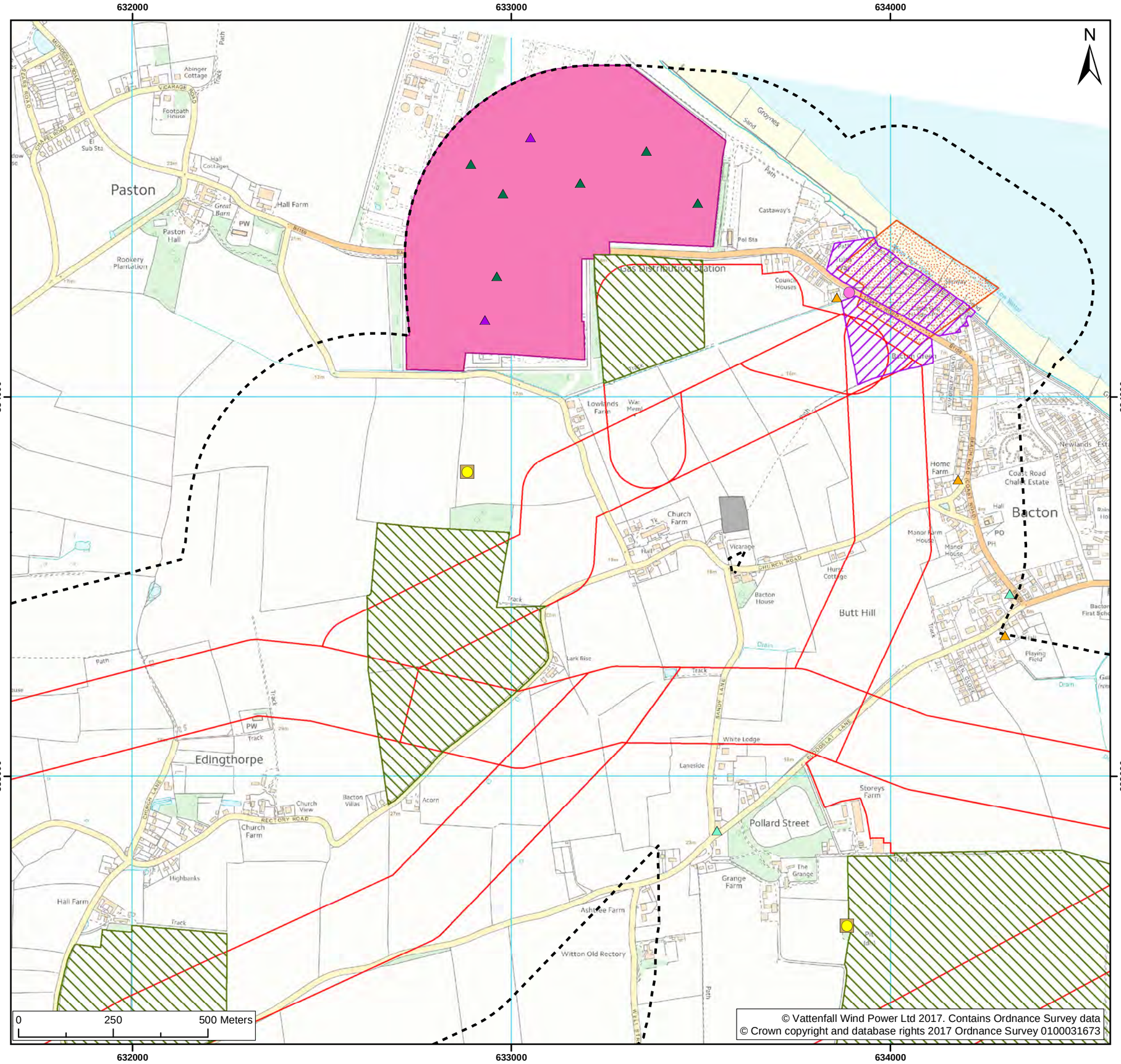

Legend:

Norfolk Vanguard Onshore Infrastructure

- Landfall Zone
- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electrical Sub Station Facilities
- Gas Industry Facilities
- Potential Tanks
- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Gas manufacture & distribution
- Electricity production & distribution [inc large transformers]
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 5 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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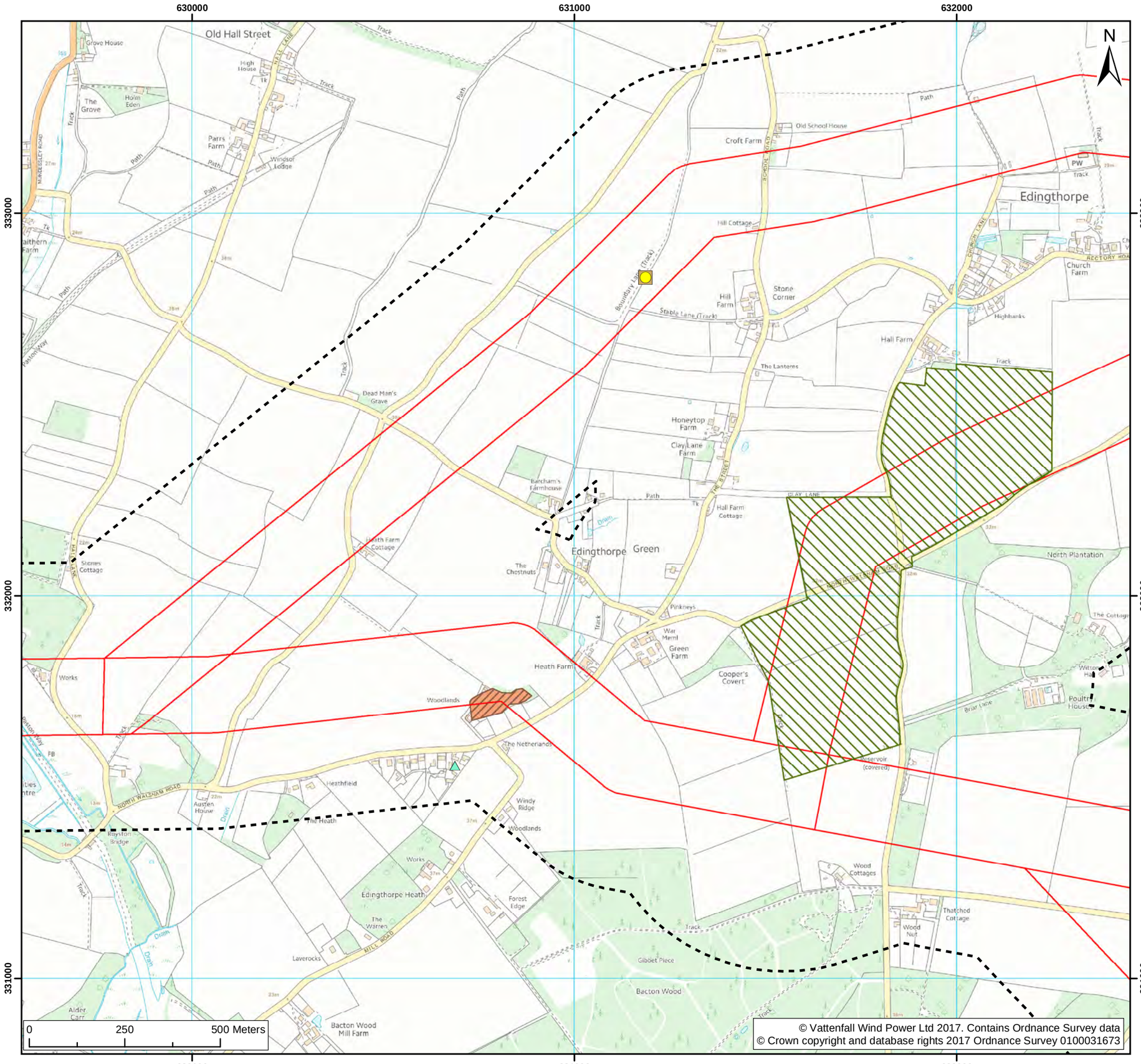

Legend:

Norfolk Vanguard Onshore Infrastructure

- Cable Relay Station Search Zone
- Onshore Cable Corridor
- Study Area

Historical Tanks and Energy Facilities[1]

- Potential Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 6 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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627000 628000 629000

332000 331000 330000

N

Swafield

NORTH WALSHAM

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electrical Sub Station Facilities

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Clay bricks & tiles [manufacture]
- Factory or works - use not specified
- Quarrying of sand & clay, operation of sand & gravel pits
- Railways
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 7 of 25)

Figure: 19.1 Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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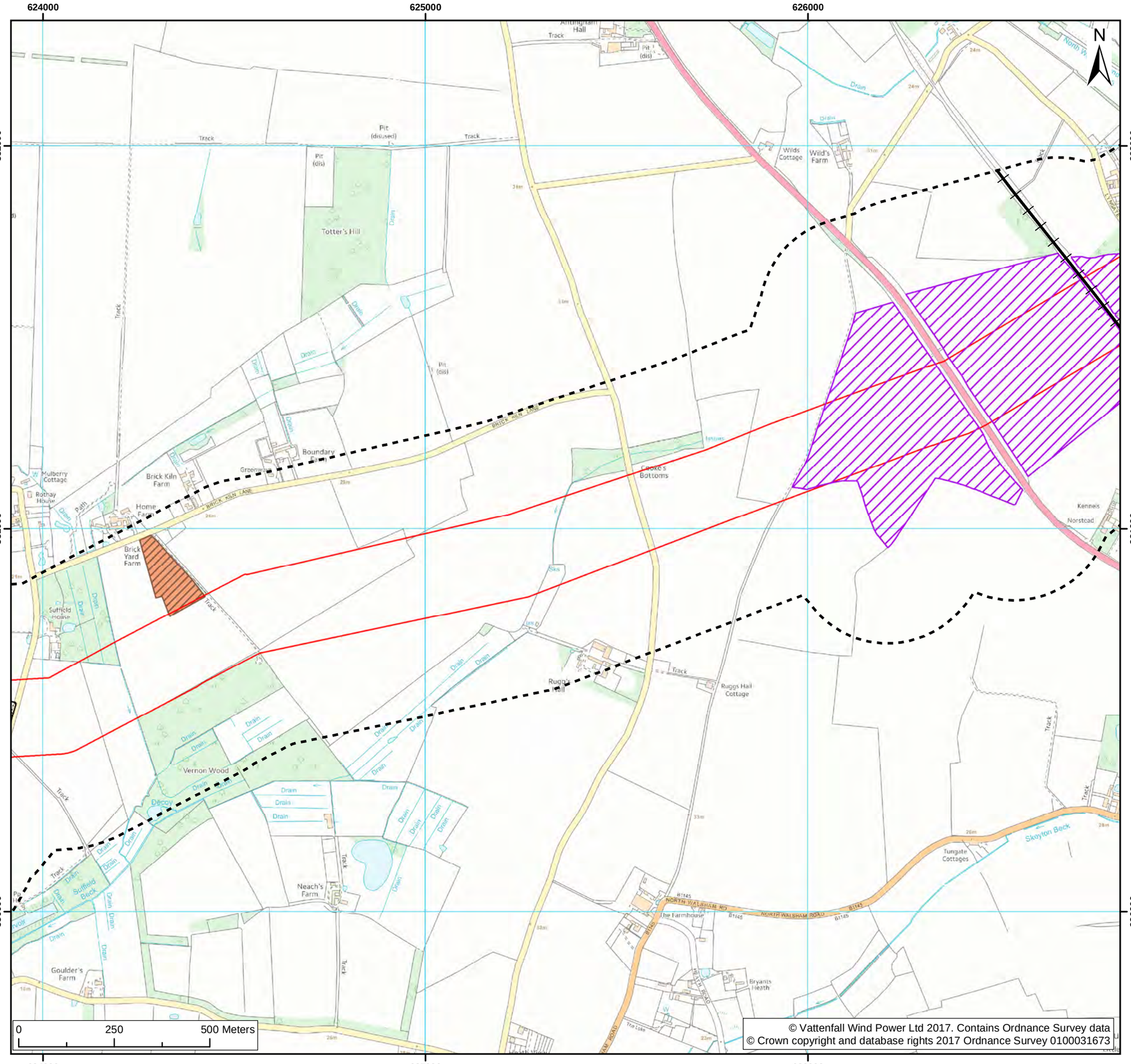

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]
- Railways

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 8 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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622000 623000 624000

331000

330000

N

Colby
Lacey's Farm
Farmhouse
Track
Drains
Drain
Pit (disused)
Hall Farm
Track
HIGH NOON ROAD
Woodpecker Cottage
Manor Farm
Bull Plantation
PW
Path
Church Field
Hall
Larksfield
Cook's Farm Barns
Thorn Plantation
Brush Plantation
Issues
Meadow Cottage
Hall Farm Cottages
Stable Cottage
Hall Farm
Lang Wood
Colby Hall Farm
Elm Farm
Banningham Hall
Meadow Cottages
Beck Farm
Colby Corner
Post Office Cottages
Wayside
Keepers Cottage
Sunnyside Farm
Higbury Farm
Oak Cottage
BRIDGE ROAD
Granary Farm
Reservoir
Suffield Beck
Goulder's Ring
Mill Farm
Camping Site
Beck Cottage
Banningham
CHURCH ROAD
Home Farm
CHURCH CLOSE
Chapel Farm
School
Oaks Farm Barn
Oaks Farm Cottage
The Old Rectory
Playing Field
Oaks Farm House
Pond Farm

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title: Historic Land Use (Map 9 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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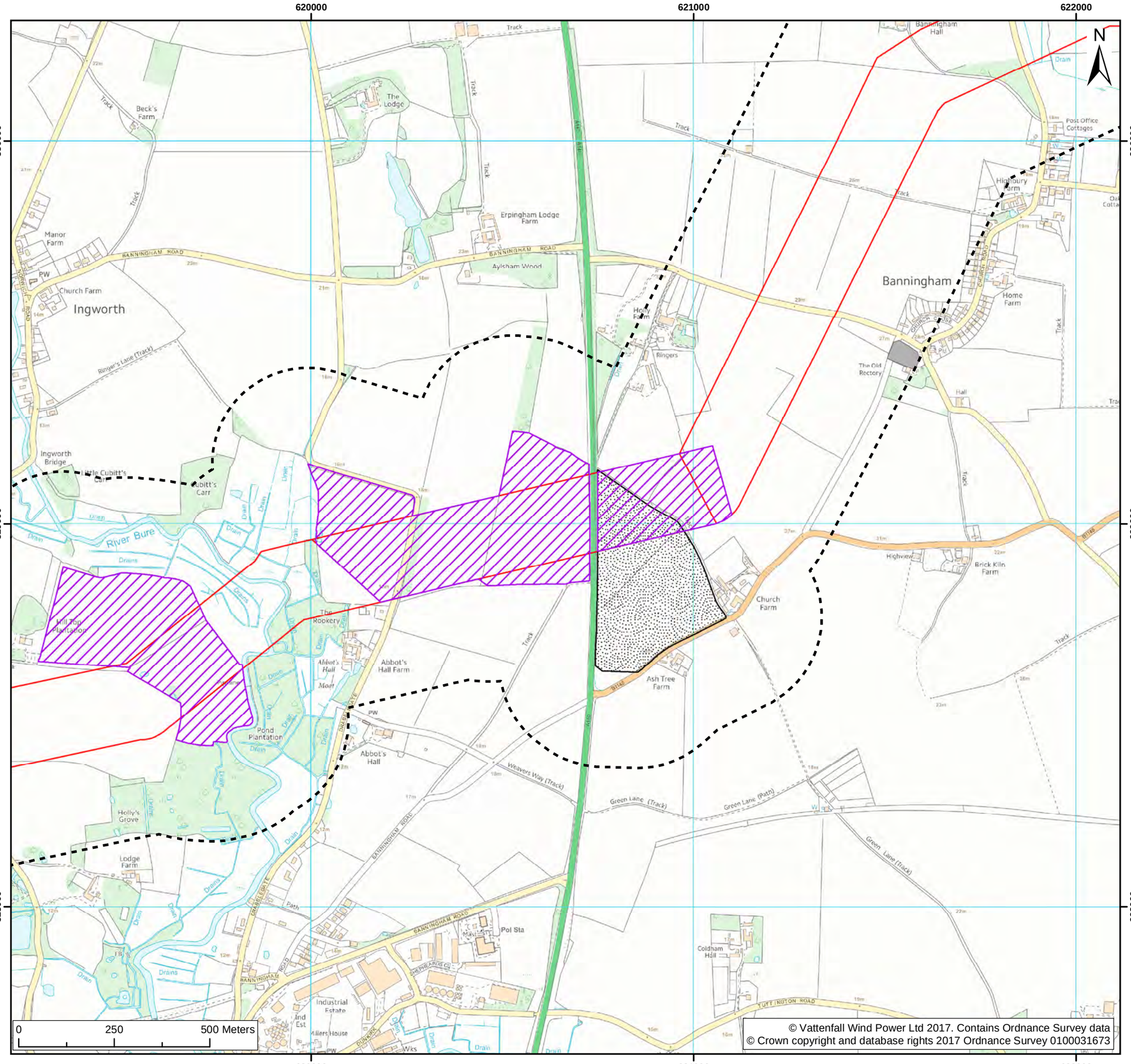

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 10 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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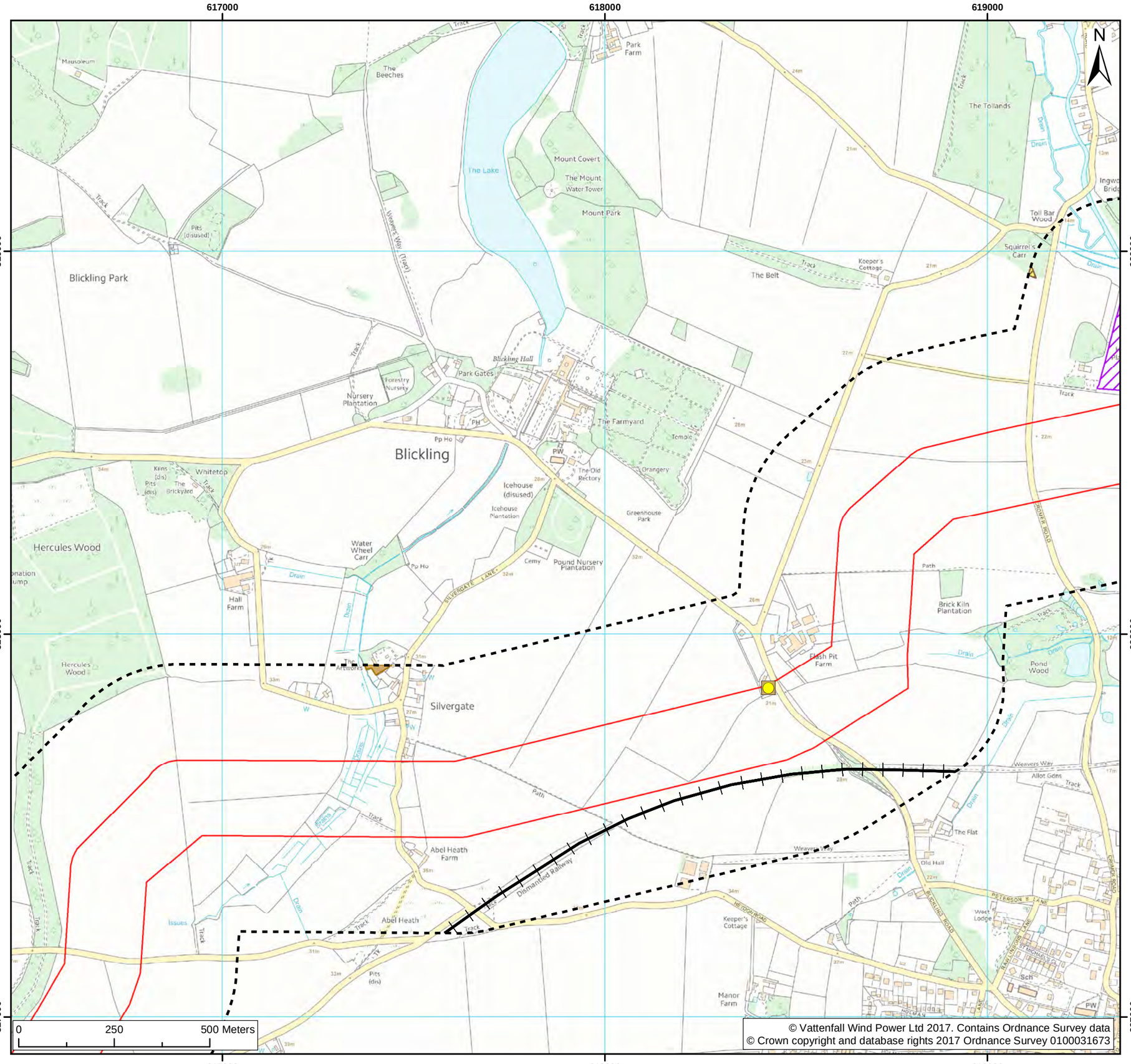

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits
- Sawmilling, planing & impregnation [i.e. treatment of timber]
- Railways
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 11 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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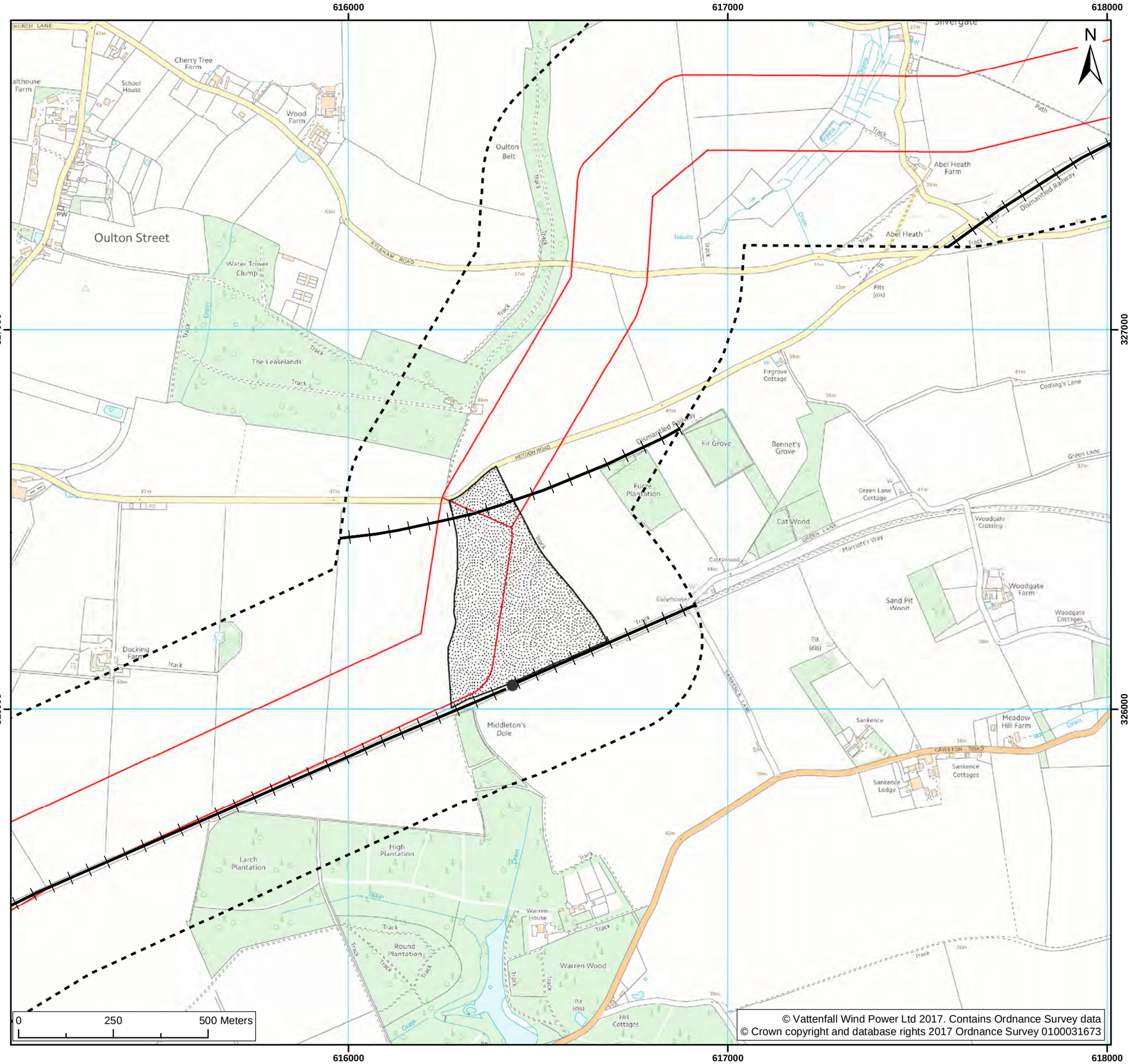

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Railways
- Railways

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 12 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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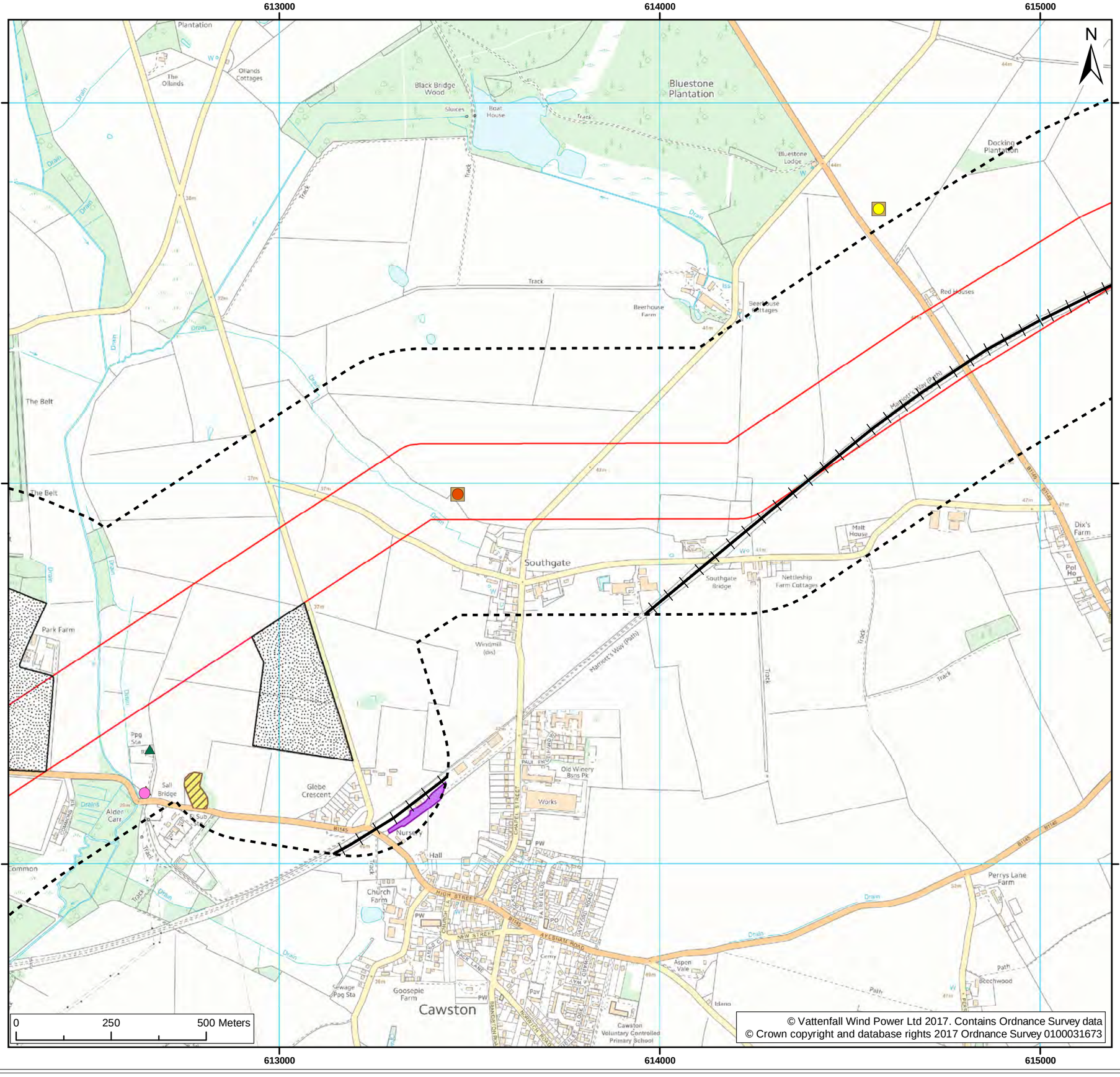

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electrical Sub Station Facilities
- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits
- Road haulage

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Railways
- Clay bricks & tiles [manufacture]
- Electricity production & distribution [inc large transformers]
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 13 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	26/04/2018	LB	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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610000 611000 612000

325000 324000 323000

N

0 250 500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Electricity Industry Facilities
- Potential Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Road haulage
- Railways
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 14 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

VATTENFALL

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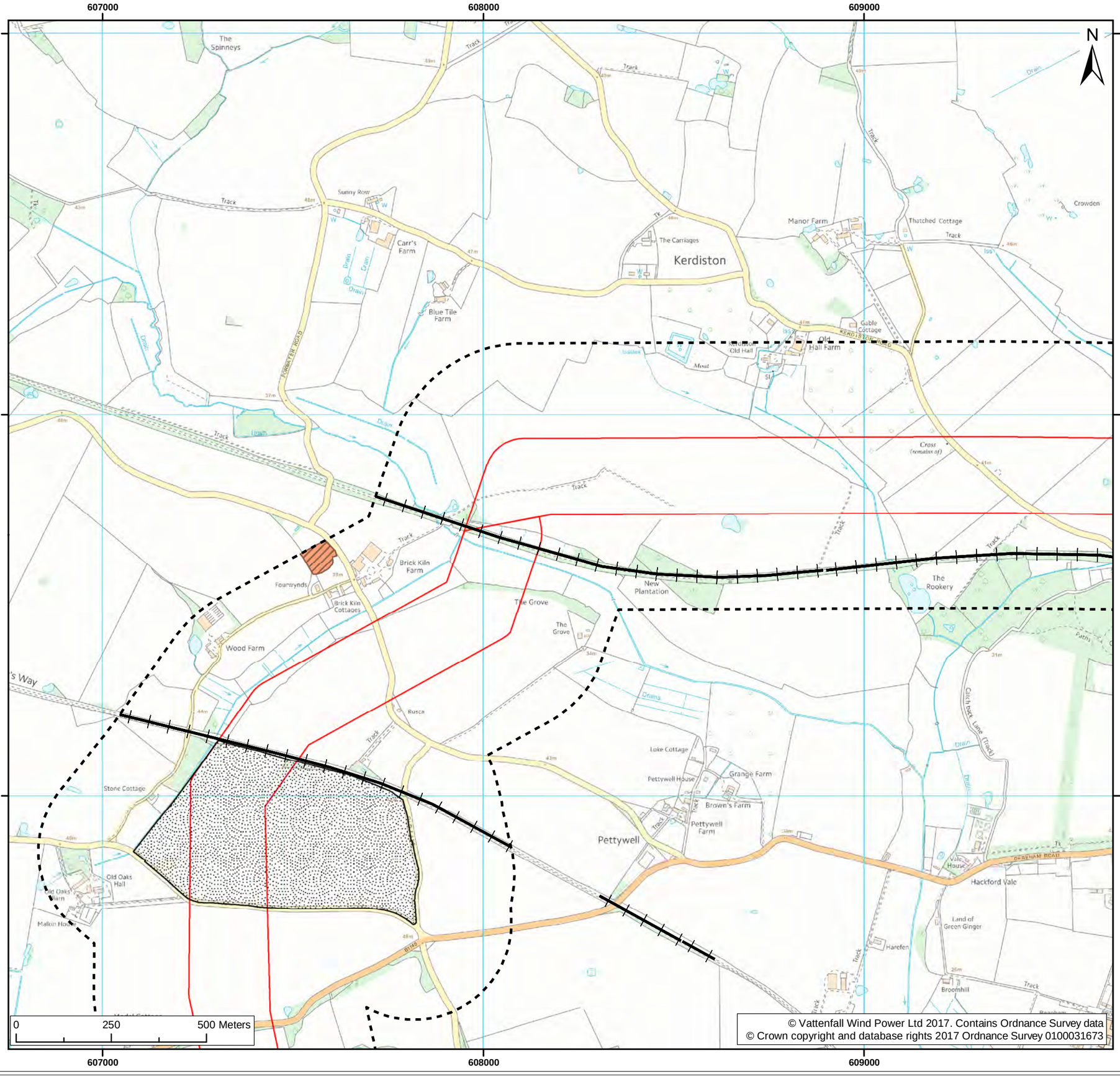

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Railways

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 15 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	26/04/2018	LB	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

VATTENFALL

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606000
607000
322000
321000
N
Foxley Wood
Kerdiston House Farm
Malkin House
Track
Drain
FIR LANE
Model Cottage Farm
Hackford Hall
Hall Lodge
Poultry Houses
Pightle Farm
Point House Farm
Wood Farm
The Shetlands
Jordan Green Farm
JORDAN LANE
Sunnyside
REEPHAM ROAD
Path
Dale Farmhouse
The Orchard
Westbury
Woofull Farm
Jordan House
Jordan Green
Jordans
Folkards Farm
ROMAN ROAD
Common Lane (Track)
Horse Ponds Wood
Jordans Wood
Reservoir Wood
Reservoir
Valley Farm
Drains
Moat
Sparham House
Sparham Wood
Manor Farm
Stud Groom Cottage
Playing Field
Pig Wood
Bawdeswell Hall
FAKENHAM ROAD
0
250
500 Meters

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)
- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 16 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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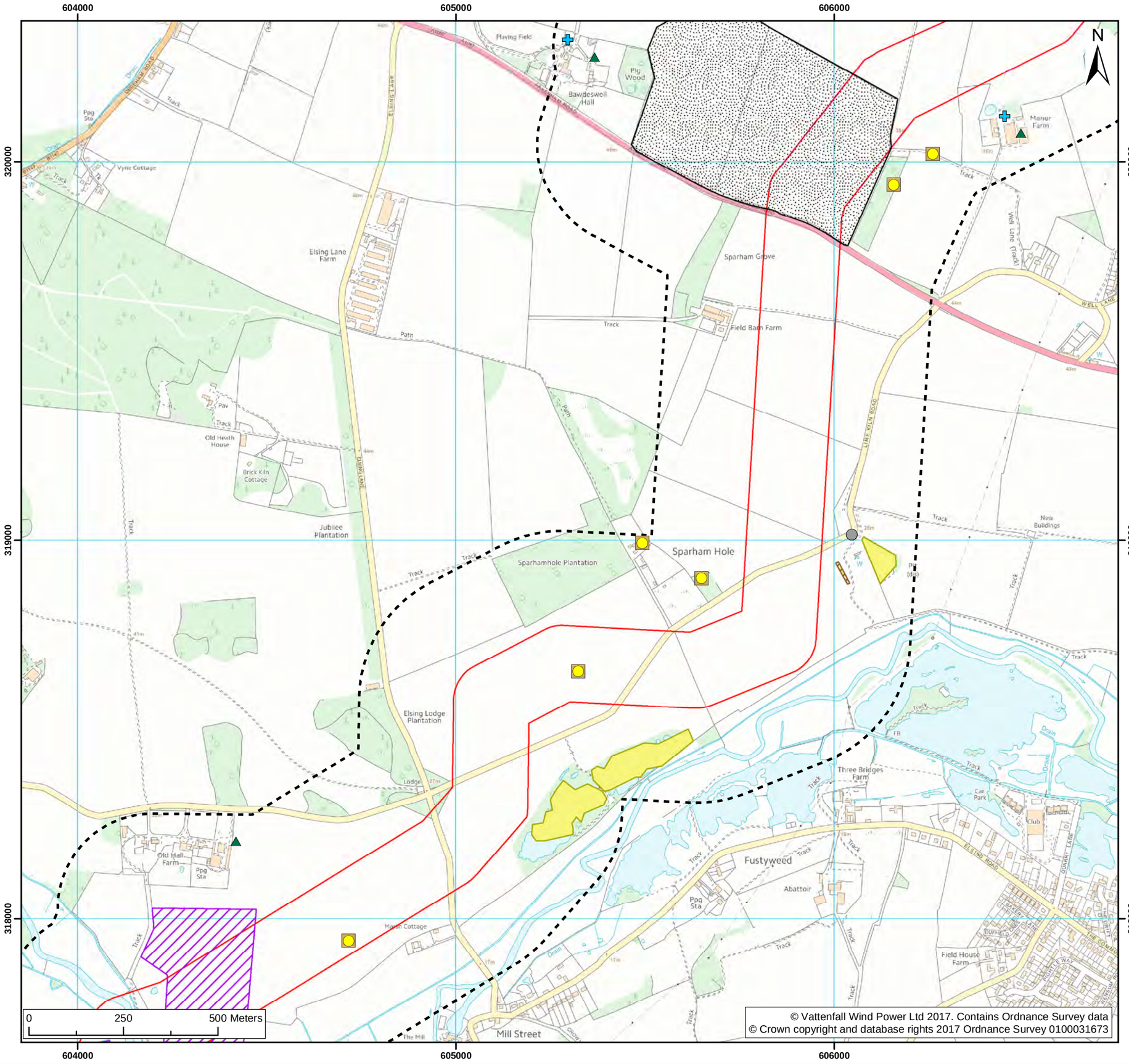

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits
- Cement, lime & plaster products [manufacture]
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 17 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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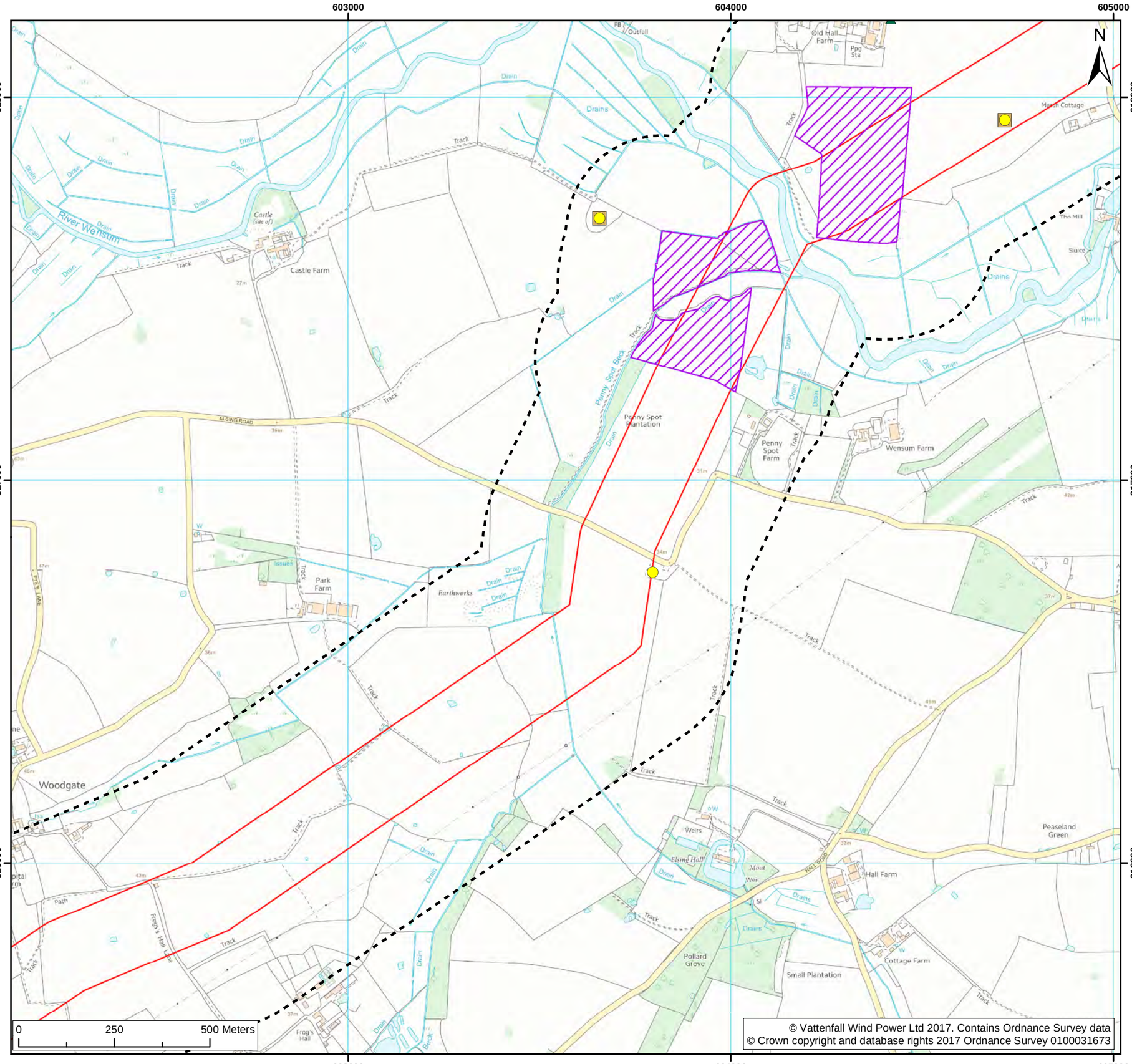

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 18 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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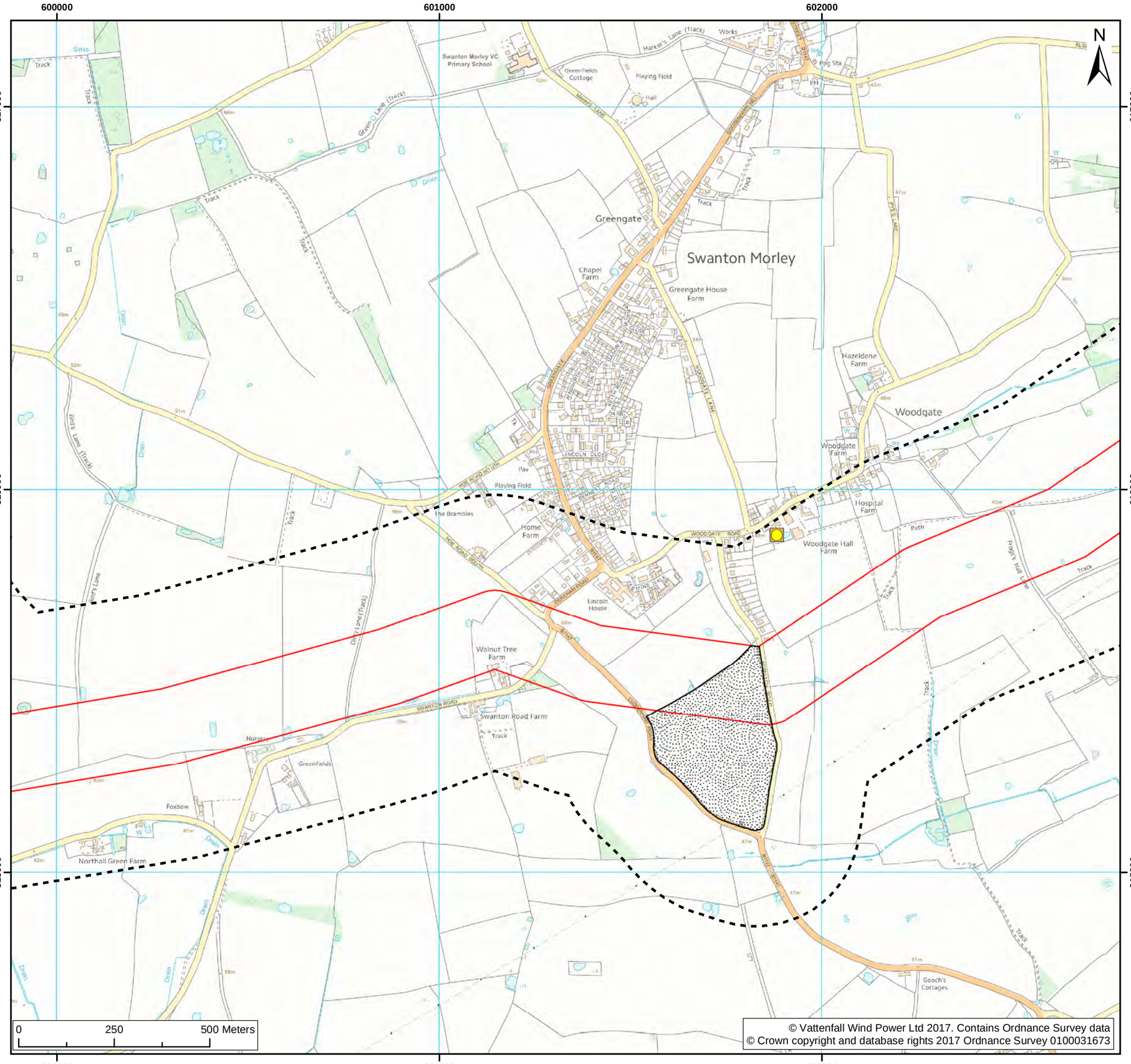

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 19 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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598000

599000

316000

315000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]
- Quarrying of sand & clay, operation of sand & gravel pits
- Railways
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 20 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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0 250 500 Meters

595000 596000 597000

315000 314000 313000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Study Area

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 21 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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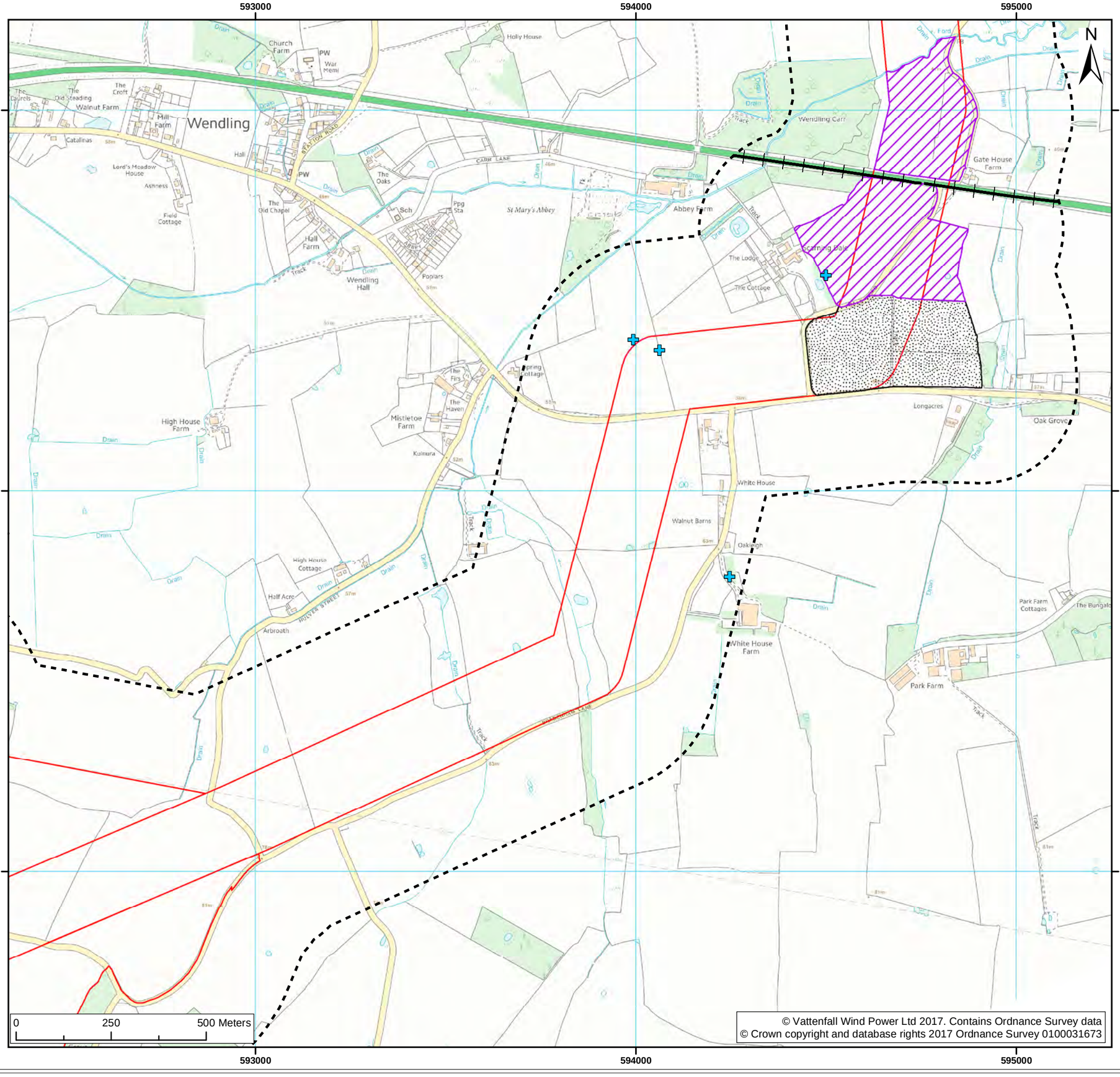
0 250 500 Meters



Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Horizontal Directional Drilling (HDD) Zone
- Mobilisation Zone
- Study Area

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Railways

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 22 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/07/2017	NJ	MW	A3	1:10,000
02	31/08/2017	NJ	MW	A3	1:10,000

Co-ordinate system: British National Grid **EPSG:** 27700

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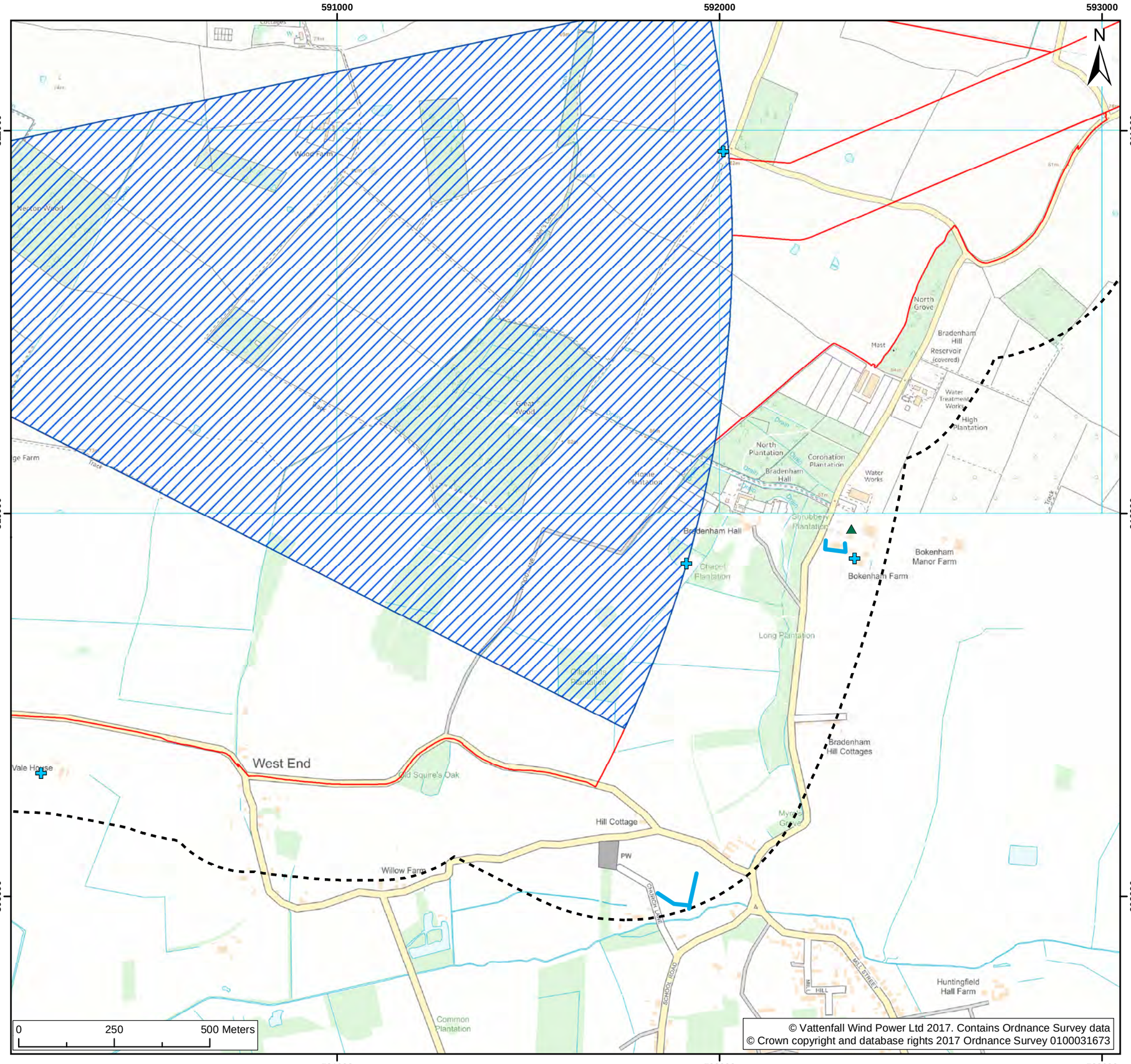

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Tanks

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)
- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Cemetery or Graveyard

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 23 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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590000 591000 592000

312000

311000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Potential Tanks
- Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 24 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid **EPSG:** 27700

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0 250 500 Meters

588000 589000 590000

311000

310000

N

Legend:

Norfolk Vanguard Onshore Infrastructure

- Onshore Cable Corridor
- Project Substation Search Zone
- National Grid Substation Extension Zone
- Overhead Line Modification Zone
- Study Area

Historical Tanks and Energy Facilities[1]

- Petroleum Storage Facilities
- Potential Tanks

Potentially Infilled Land (Non-Water)[1]

- Unknown Filled Ground (Pit, quarry etc)
- Unknown Filled Ground (Pit, quarry etc)

Potentially Infilled Land (Water)[1]

- Unknown Filled Ground (Pond, marsh, river, stream, dock etc)

Potentially Contaminative Industrial Uses (Past Land Use)[1]

- Clay bricks & tiles [manufacture]
- Motor vehicles: maintenance & repair e.g. garages
- Quarrying of sand & clay, operation of sand & gravel pits

[1] Envirocheck, 2017

Project:	Report:
Norfolk Vanguard	Land Quality Phase 1 Preliminary Risk Assessment

Title:

Historic Land Use
(Map 25 of 25)

Figure: 19.1 | Drawing No: PB4476-004-0191-001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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0 250 500 Meters

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