DOGGER BANK
TEESSIDE A & B

March
2014

Environmental Statement Chapter 24 Appendix B Flood Risk Assessment

Application Reference: 6.24.2

Cover photograph: Indicative image showing installation of meteorological mast within the Dogger Bank Zone

Dogger Bank – Teesside A & B

Flood Risk Assessment

Forewind Ltd

15 January 2014
Final Report
9W7904

Royal HaskoningDHV
Enhancing Society Together

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Date/initials approval	

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1.1 Background

1.1.1 Royal HaskoningDHV has been commissioned by Forewind to carry out an Environmental Impact Assessment (EIA) for both the offshore and onshore elements of Dogger Bank Teesside A & B. As part of the onshore EIA a Flood Risk Assessment (FRA) is required; this will also accompany the Development Consent Order (DCO).

1.1.2 Dogger Bank Teesside A & B is Forewind's second stage of development of the Dogger Bank Zone. Dogger Bank Teesside A & B will each have a maximum installed capacity of 1.2GW. The onshore element comprises all infrastructure landward of the Mean High Water Mark (MHWM) including:

- A preferred landfall location between Redcar and Marske-by-the-Sea (shown in **Appendix A** Figure 1);
- Two buried High Voltage Direct Current (HVDC) cable systems (each cable system contains a pair of main cables and communications within a single trench) (shown in **Appendix A** Figure 2);
- Two converter stations and associated development (shown in **Appendix A** Figure 3); and
- Two buried High Voltage Alternating Current (HVAC) cable systems (one per project) connecting the converter stations to the existing National Grid substation at Lackenby (shown in **Appendix A** Figure 3).

1.1.3 The onshore cable corridor begins at the landfall between the town of Redcar and the village of Marske-by-the-Sea (**Appendix A**, where the export cables come ashore. The two main cable construction techniques proposed are trenching and horizontal direction drill (HDD). Trenching will be used along the majority of the route, while HDD will be used to cross significant obstacles such as watercourses, rail lines and major roads where trenching cannot be achieved (6 no. HDD crossings are detailed in **Appendix A** Figure 2). During HDD tunnels are bored under the structure and the cables pulled through the underlying geology.

1.1.4 The project area this FRA covers is:

1. The underground onshore High Voltage Direct Current (HVDC) cable route from landfall to the converter stations site;
2. The converter stations site;
3. The High Voltage Alternating Current (HVAC) cable route between the converter stations site and the existing National Grid substation at Lackenby; and
4. The National Grid enabling works at the existing National Grid Electricity Transmission (NGET) Lackenby Substation (National Grid to consent separately if required).

1.1.5 This FRA has been produced in accordance with the National Planning Policy Framework (NPPF) and associated Technical Guidance, published in March 2012. The flood risk principles within the NPPF are to avoid inappropriate development in areas at risk of flooding and, wherever possible, to direct development away from areas of highest risk. Local authorities should steer development to Flood Zone 1 (low risk), and

only consider development in, sequentially, Flood Zones 2 and 3 if there is no appropriate and available site in an area of lower flood risk.

1.1.6 All works for the onshore development of Dogger Bank Teesside A & B are within Flood Zone 1 and as such are complying with the NPPF requirement to avoid development in areas at risk of flooding.

1.1.7 During the development of the FRA, pre-planning consultation has been carried out with the Environment Agency (EA), Redcar & Cleveland Borough Council (RCBC) and Northumbrian Water to discuss the risks of flooding to and from the development which have been assessed and determined through the work completed.

1.2 Site Location

1.2.1 The preferred location for the converter stations site is shown in Figure 3 of **Appendix A**. One key factor in selecting this as the preferred site is its location in Flood Zone 1 (therefore passing the flood risk sequential test).

1.2.2 Other additional factors assessed at the site selection phase were favourable to select this site, such as; reasonable site access, proximity to the National Grid site; a receptive landowner in Wilton International, excellent site capacity (34Ha) for development and also a preferable cable route option to this site.

2 DEVELOPMENT AND FLOOD RISK

2.1 Type of Development and Location

Converter Stations Site

2.1.1 The chosen location for the converter stations site is within the Wilton Complex, a privately developed industrial site.

2.1.2 The operational footprint of each converter station is approximately 2 hectares (shown in **Appendix A** Figure 3). The development will comprise two converter stations which will convert direct current (DC) export power to 400kV alternating current (AC) prior to connection to the existing NGET substation at Lackenby.

HVDC & HVAC Cable Routes

2.1.3 The onshore High Voltage Direct Current (HVDC) cable route starts between Redcar and Marske-by-the-Sea on the East Yorkshire coast, and extends in a westerly direction prior to reaching the converter stations site in the Wilton Complex just east of Lackenby, the High Voltage Alternating Current (HVAC) cable route then extends from the converter stations site to the substation at Lackenby. Figures showing the HVDC and HVAC cable route are included as **Appendix A**; the cable routes will cross the A174 in two locations and the A1053 (Greystone Road) as well as crossing 7 no. minor roads (including private roads), 2 notable watercourses and a railway line. The cables will be buried for the entire length of the route from landfall to the converter stations site, and will be installed using both conventional open trench and HDD techniques for construction.

National Grid Enabling Works

2.1.4 The existing Lackenby substation is located approximately 1.5km to the south east of the converter stations site and can be seen on Figure 3 in **Appendix A**.

2.1.5 National Grid has confirmed that the enabling works proposed for their site are to be contained within the building extensions on the existing site. As the existing site is entirely within Flood Zone 1 there is no further consideration required as part of this Flood Risk Assessment.

2.1.6 However, confirmation of this is to be acquired by National Grid separately to this assessment. The National Grid Flood Mitigation Policy (**Appendix E**) states that early consultation should be carried out with the EA and RCBC irrespective of whether planning permission will be required.

2.2 Vulnerability Classification

2.2.1 In terms of flood risk and vulnerability, Table 2 of the NPPF Technical Guidance classifies all the components of the development; converter stations site, buried cable systems and works at the existing NGET substation at Lackenby as 'Essential Infrastructure'. Table 3 of the Guidance indicates that developments of this flood type are considered to be appropriate in Flood Zones 1 and 2 but are permitted in Flood

Zones 3 if the 'Exception Test' can provide further justification for locating them there. The application of the Sequential Test should guide development to Flood Zone 1 first, then Flood Zone 2 and finally Flood Zone 3.

2.2.2 The following section of this report identifies how the flood risk along the HVDC & HVAC cable routes and at the converter stations site has been assessed, and confirms that the flood risk Sequential Test has been appropriately applied. This exercise has not yet been undertaken for any potential enabling works at the existing NGET substation at Lackenby.

2.2.3 The report also details and confirms that all of the works areas are within Flood Zone 1.

3 DEFINITION OF FLOOD HAZARD

3.1 Data used for the FRA

3.1.1 The following data has been collected and used for the FRA:

- Overall onshore layout details (**Appendix A** Figures);
- Site photos (**Appendix B**); and
- Consultation with Northumbrian Water, EA and RCBC (**Appendix C**).

3.2 Site Visit

A site visit was carried out on 28 November 2012 by a number of the EIA team including the technical expert responsible for the FRA. A selection of site photos from the visit can be found in **Appendix B**. The site visit was relevant to better understand the works, to ascertain the site layout and topography and the existing drainage features in the vicinity of the converter stations site.

3.3 Consultation and Local Development Documents

Strategic Flood Risk Assessment

3.3.1 In March 2010, RCBC published a Level 1 Strategic Flood Risk Assessment (SFRA) in which provides baseline information on flood risk in the authority area. The SFRA is a tool which plays an important role in delivering sustainable development; it is the starting place from which the sequential test can be applied in order to direct development towards Flood Zone 1.

3.3.2 The SFRA identified that there is a risk of flooding to numerous areas within RCBC, predominantly tidal flood risk in the coastal areas to the east of the Borough. The SFRA indicates that the entirety of the cable route from the landfall and the converter stations site is within Flood Zone 1 and is therefore considered to have a low risk of fluvial flooding; less than a 1 in 1000 annual probability.

3.3.3 The SFRA recommends that runoff for developments in all flood zones should be reduced through the implementation of Sustainable Drainage Systems (SuDS). The SFRA also states that development on greenfield sites will be expected to restrict runoff to the greenfield runoff rate whilst brownfield sites will be expected to reduce existing runoff rates by a minimum of 30%.

Local Development Documents

3.3.4 RCBC have commenced work on the preparation of a new Local Plan that will eventually replace the Local Development Framework (LDF) as the statutory development plan for the borough. These changes are being made in response to the Government's National Planning Policy Framework, which was published in March 2012.

3.3.5 The LDF which is currently in place with RCBC is being phased out as part of the Local Development Scheme between 2012 and 2015, with the proposed adoption of the Local

Plan in August 2014. The LDF comprises a suite of documents, including a core strategy, development plan documents and associated supplementary planning documents.

3.3.6 The key policies within the current RCBC LDF Core Strategy (adopted July 2007) relevant to the Flood Risk Assessment are:

3.3.7 CS1 – Securing a Better Quality of Life – Cross linked to Policy 2 of the Borough's Regional Spatial Strategy (RSS), the principle of Sustainable Development underpins the policies and proposals for the use and development of land in the LDF. Specific to the FRA process, this includes controlling development in areas at risk of flooding.

Consultation

3.3.8 The EA, RCBC and Northumbrian Water have been consulted to gain information for the FRA (copies of all emailed consultation responses are included in **Appendix C**), and all this information has been taken into account when developing this report.

3.3.9 The EA has responded confirming there are no historic flooding issues in the vicinity of the converter stations site.

3.3.10 RCBC responded confirming that that the proposed route of the works is within Flood Zone 1. They have also referred to the RCBC Strategic Flood Risk Assessment to confirm that the works will not be affected by surface water flooding. Finally, RCBC confirmed they hold no records of flooding in the areas highlighted.

3.3.11 For information, RCBC states in the response that the proposed route will cross a number of watercourses and any works, on, in or near a watercourse will require their consent.

3.3.12 Northumbrian Water has responded to our consultation, again confirming there is no sewer flooding incidents recorded in the vicinity of the converter stations site or the wider cable route area.

3.4 Potential Sources of Flooding to the Converter Stations Site

3.4.1 The Technical Guidance that supports the NPPF states that there are a number of sources of flooding which need to be considered within any FRA. The potential sources of flooding to the converter stations site are discussed in the sections below.

Flooding from Rivers

3.4.2 The nearest main river watercourse to the converter stations site is the River Tees, approximately 4km north west of the site. This watercourse is a major river in the north east of England which passes through the town of Middlesbrough before discharging into the North Sea. There is no flood risk to the site from this watercourse or any other in the vicinity of the site.

3.4.3 The EA have confirmed there is no historic record of flooding in the area.

Flooding from the Sea (Tidal or Coastal)

3.4.4 There is no tidal flood risk to the converter stations site.

Pluvial Flooding

3.4.5 Volume II of the RCBC Level 1 SFRA (March 2010) confirms there are no historic flooding locations shown near the site and this is confirmed by the consultation response by RCBC noted in section 3.3.10.

3.4.6 Therefore, the requirement for the development of the site is to ensure that the converter stations site does not increase risk elsewhere.

Sewer Flooding

3.4.7 The sewer layout around the converter stations site has been reviewed. This review has shown that there are no foul or combined sewers in the immediate vicinity of the site. Therefore sewer flooding is not considered an issue.

3.4.8 This has been confirmed through consultation with Northumbrian Water who also confirms there is no historical flooding evident in the vicinity of the site.

Groundwater

3.4.9 Groundwater flooding can occur when water stored beneath the ground reaches the surface and is generally associated with porous rocks, e.g. sands and gravels. The Level 1 SFRA (Vol II) refers back to the Draft Tees Catchment Flood Management Plan (CFMP) which states that there is little documented evidence of groundwater flooding in the Tees catchment.

Climate Change Impacts

3.4.10 The NPPF Technical Guidance outlines that an increase of 20% and 30% should be given to peak river flows and rainfall intensities respectively. This allowance is recommended as a sensitivity check for assessment. This is not relevant to this FRA as the application of climate change sensitivity allowance to the existing flooding outlines will not affect any of the works area.

3.5 Potential Sources of Flooding to the HVDC and HVAC Cable Routes

Flooding from Rivers

3.5.1 A screening of the proposed HVDC and HVAC cable routes from landfall to the converter stations site and from the converter stations site to the existing NGET substation at Lackenby was carried out to understand any significant flood risk issues. The focus of the screening was on the construction stage alone (and not on the permanent works), as on completion of construction the entire cable route will be underground. The screening process identified that the cable route does not cross any areas within Flood Zones 2 and 3 and is therefore considered to be at low risk.

Table 3.1 Cable route screening summary

Crossing ref.	Watercourse type and name (if any)	Flood Zone of crossing point	Construction method to be used	Assumed source of flood risk (if any)	At Risk Nearby (within c. 50m) / adjacent properties and type (if any)
1	Assumed land drain adjacent to Cat Flatt lane	1	Open cut with overpumping if required	None	None
2	land drain along field boundary close to Grewgrass Farm	1	Open cut with overpumping if required	None	None
3	Roger Dike	1	To be crossed using HDD - no residual risk during construction	None	None
4	Land drain running north - south, parallel with Fishponds Road	1	To be crossed using HDD - no residual risk during construction	None	None
5	Mains Dike (close to Mains Dike Bridge on the A174)	1	To be crossed using HDD - no residual risk during construction	None	None
6	South Avenue surface water drain	1	To be crossed using HDD - no residual risk during construction	None	None
7	Kettle Beck adjacent to the A1053 (Greystone Road)	1	To be crossed using HDD - no residual risk during construction	None	None
8	Drain from Kettle Beck adjacent to the A1053 (Greystone Road)	1	Haul road crossing with temporary bridge and culvert	Channel restriction	None

3.5.3 The following reasons account for this conclusion:

- The cable route has already been selected to avoid developed areas where possible. It is generally undeveloped and so watercourse crossings do not coincide with built up areas. Therefore there is limited potential for flood risk

impacts to properties associated with crossing watercourses during the construction phase;

- The only watercourses of any significance (Roger Dike & Mains Dike) are being dealt with by crossing them using HDD in order to reduce the potential impact (including flood risk); and
- The other watercourses identified are minor drainage ditches and therefore any flood risk issues are likely to be localised to the crossing point rather than have any wider impacts. Crossing these ditches by cutting through and overpumping (for example) is unlikely to cause any significant increase in flood risk.

Flooding from the Sea (Tidal or Coastal)

3.5.4 The EA flood map indicates that there is tidal flood risk to the foreshore in the vicinity of the landfall site. However, the area of foreshore is significantly lower than the hinterland. Therefore there is no tidal flood risk inland of this point.

3.5.5 The River Tyne to Flamborough Head Shoreline Management Plan 2 (February 2007) states that the policy for the Management Area of the coast associated with the landfall site (MA15.1) is 'No Active Intervention'. This policy will have no implications on flood risk going forward when considering the cable routes and landfall.

4 IMPACT ON LOCAL FLOODING REGIME

4.1 Converter Stations Site

4.1.1 The converter stations site is not within a fluvial floodplain and therefore they will not reduce flood storage or affect fluvial flow routes.

4.1.2 Approximately two-thirds of each converter station operational area will be roofed (valve hall and control building). The remainder of the area includes the external AC yard and access roads. All of this area will be impermeable, whereas the current land use is agricultural grassland. The converter stations site will therefore result in an increase in impermeable area compared to current use at the site; any consequent increase in runoff will have to be mitigated to ensure no increase in flood risk elsewhere.

4.2 HVDC Cable Route

4.2.1 The cable route will cross only two watercourses of note (Roger Dike and Mains Dike), as well as some smaller land drainage ditches. On completion of the works the cable will be fully underground. HDD will be used to lay the cables under Roger Dike and Mains Dike which will ensure no impact to the watercourses. It is currently being proposed that the cable will be cut through any smaller watercourses which it is required to cross. However, as the route runs through predominantly undeveloped areas it is unlikely that cutting through watercourses will cause increased flood risk to residential property, especially when the limited amount of time for which the cutting will be in place during construction is considered.

4.2.2 After completion the cable will be fully underground and watercourses will be reinstated; there will therefore be no residual flood risk issues.

5 FLOOD RISK MANAGEMENT MEASURES

5.1.1 In order to manage the surface water run-off from the converter stations site, an adequate drainage system is required. When developed in detail the surface water drainage system for the stations should consider operation and maintenance issues. The system should be robust, prevent blockages and allow ease of maintenance and reduce long term maintenance costs.

5.2 Converter Stations Site Drainage

5.2.1 Ramboll are contracted civil engineers working on behalf of Forewind. Ramboll has produced an Initial Drainage Assessment (**Appendix D**) which has outlined the calculated volumes of runoff which need to be managed. The surface water attenuation will be sized for at least the 1 in 100 storm event plus an allowance of 30% for climate change. Storage of the surface water either above or below ground through attenuation is required prior to discharge at a restricted rate. An allowable discharge rate of 16.2 litres/second (l/s) is proposed based on greenfield runoff rates using the Institute of Hydrology Report 124 methodology. This will be confirmed through consultation with the EA and RCBC.

5.2.2 Based on the proposed allowable discharge rate of 16.2 l/s for the site and the impermeable area of the converter stations site, Ramboll has calculated the following surface water storage which will be required to achieve greenfield run off rates (until the detailed design is finalised ranges of potential attenuation volume requirements are given at this stage; the final figure will depend on drainage design and configuration):

- 1 in 30 year – between 550m³ and 800m³;
- 1 in 100 year – between 750m³ and 1100m³; and
- 1 in 100 year + 30% CC – between 1050m³ and 1550m³.

5.3 Identified SuDS Solutions

5.3.1 In order to provide sufficient attenuation of runoff in order to achieve the equivalent greenfield site runoff rate, SuDS will be required. Ramboll has carried out a surface water assessment and has proposed a number of potential options to attenuate the flow. These attenuation options are discussed in detail in the initial drainage assessment report in **Appendix D**, with a summary of the options below.

5.3.2 *Permeable or porous surfaces* – This will be feasible for use on access roads and in parking areas.

5.3.3 *Swales* – These grassland depressions will be lined and will convey surface water runoff to a storage system. This option is feasible for the collection of water from the access roads around the perimeter of each converter station. As infiltration is deemed undesirable for the site, these features will need to be lined.

5.3.4 *Above ground storage, detention basins or ponds* – these features provide attenuation of surface water run-off in storm conditions but can require considerable land take.

5.3.5 *Underground Storage* – An underground system could be fitted to the drainage system to provide large storage volumes in a small area. This could be a feasible option and placed under the car parking area, roads or soft landscaped areas.

5.3.6 Consultation with the site owner confirmed there is suitable private surface water drainage available in the vicinity which discharges to an open drainage ditch on Southway (shown in the site photos in **Appendix B**) which flows into Mains Dike. This system is considered sufficient to accept the additional surface water runoff from the converter stations site.

5.3.7 The Initial Drainage Assessment states that swales and a detention basin are the most viable methods for conveying and attenuating the surface water runoff from the areas of hardstanding prior to discharge into the adjacent drainage ditches. This is both because the receiving drainage ditch itself is relatively shallow, and therefore surface drainage systems are preferable, and also because the swale and detention basin can provide additional ecological habitat.

5.4 Residual Risk Management

5.4.1 Relevant measures from the above list will be included in the final design to ensure that on completion of construction there will be a low residual risk to the converter stations site. As there is no residual risk of flooding associated with the development, only standard measures are suggested.

6 CONCLUSIONS AND RECOMMENDATIONS

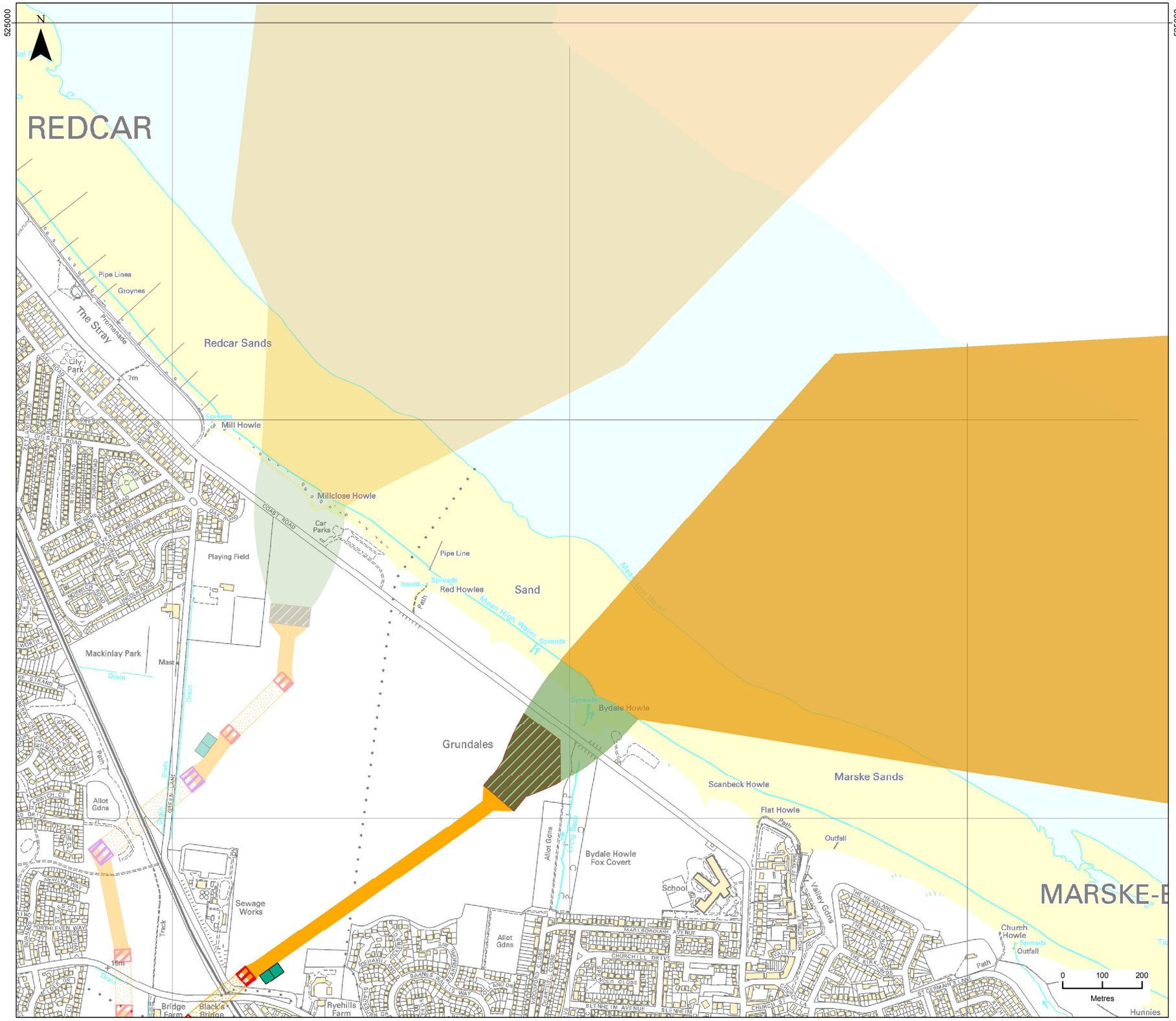
6.1.1 Flood risk issues at the converter stations site have been assessed for both flood risk to the site and also any potential flood risk issues that their construction could cause. The key conclusions from the FRA are:

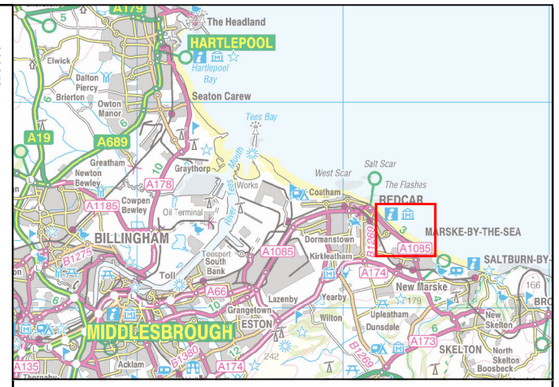
- Consultation has been carried out with the EA, RCBC and Northumbrian Water;
- The converter stations site is within Flood Zone 1 demonstrating it is not at risk from fluvial sources;
- Solutions are proposed within the design to reduce the rate of surface water runoff from the converter stations site; and
- The enabling works at the existing NGET substation at Lackenby are to be carried out within the existing site which is entirely within Flood Zone 1.

6.1.2 The cable route between the landfall and the site of the converter stations site has also been assessed for flood risk only during construction. Once operational it will be underground. There are no significant flood risk issues identified with the associated watercourse crossings as the location of the cable route was selected to avoid developed areas where possible. It is generally rural and so watercourse crossings do not coincide with built up areas. HDD will be used to cross the significant watercourses to ensure there is no disruption to watercourse flow. Smaller watercourses and ditches are likely to be open cut trenching, however this is still to be confirmed through further consultation.

6.1.3 Based on the information gathered and the proposed mitigation measures, in line with the technical guidance provided by the NPPF, it is considered that the construction of converter stations on the site are appropriate in terms of flood risk and, further, meet key consultees requirements.

Appendix A - Figures





LEGEND

Teesside A & B

- Teesside A&B export cable
- Teesside A&B cable landfall
- Teesside A&B landfall construction
- Teesside A&B HVDC, Open
- Teesside A&B HVDC,
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B intermediate construction compound

Teesside C & D

- Teesside C&D export cable route
- Teesside C&D cable landfall envelope
- Teesside C&D landfall construction envelope
- Teesside C&D HVDC, Open trench
- Teesside C&D HVDC, HDD
- Teesside C&D major horizontal directional drill entry or exit locations (2,000m²)
- Teesside C&D minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside C&D intermediate construction compound (784m²)

PROJECT TITLE

DOGGER BANK R3 DEVELOPMENT

DRAWING TITLE

Figure 1: Dogger Bank Teesside A & B - Landfall

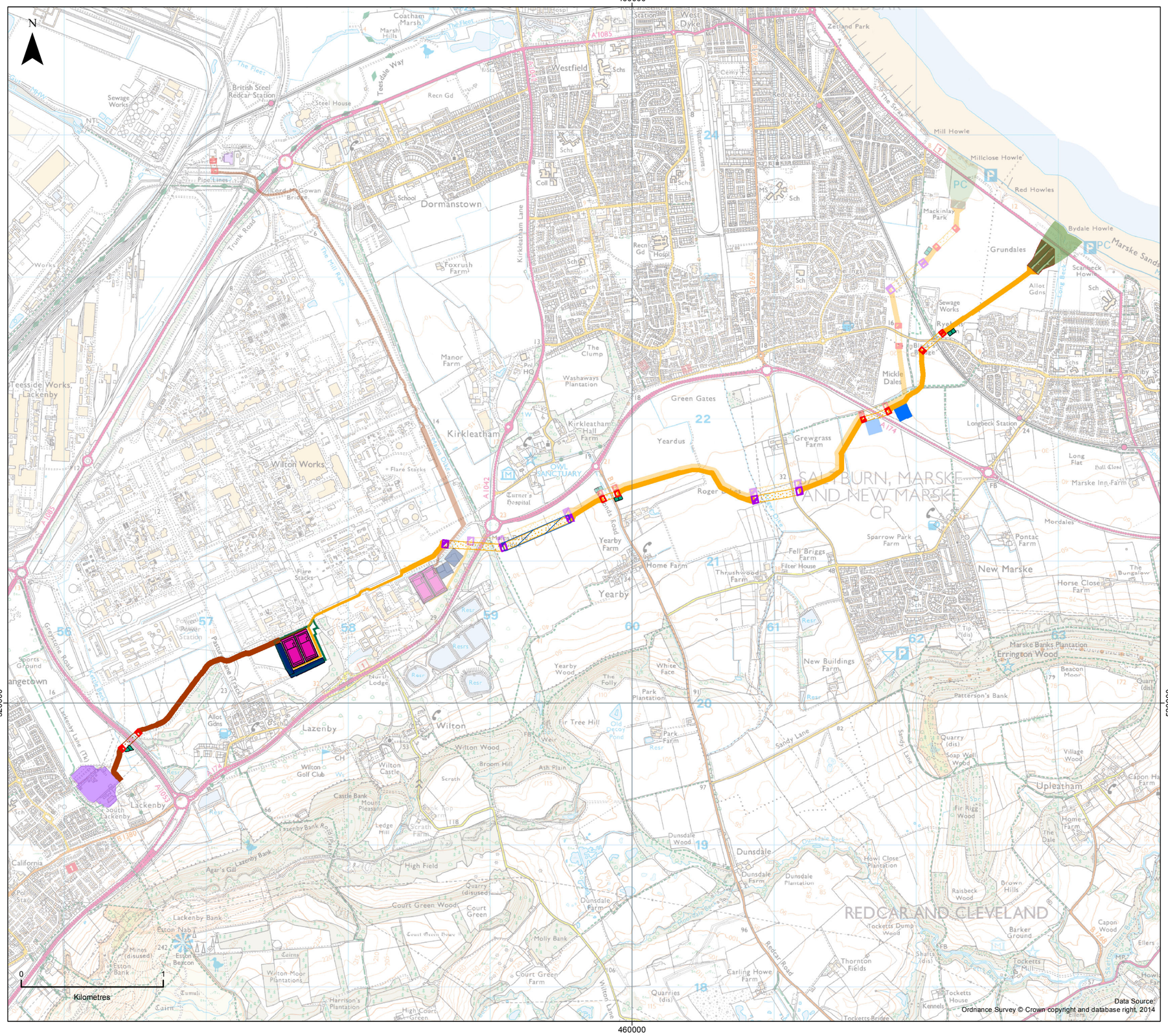
VER	DATE	REMARKS	Drawn	Checked
1	05/02/2014	CPD v6.1	SW	DW
2	11/02/2014	Pre-DCO submission review	LW	DW
3	19/02/2014	Pre-DCO submission review	SW	DW

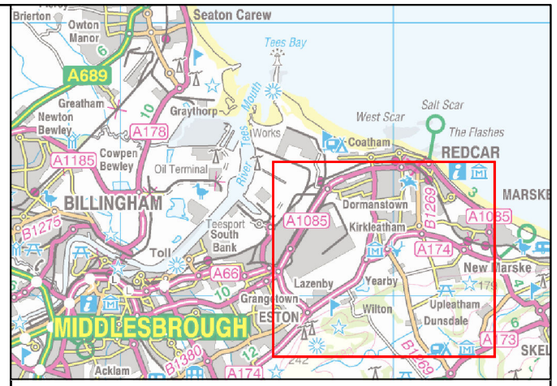
DRAWING NUMBER:

T-DES-0149-01

SCALE	1:10,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND





LEGEND

- Teesside A&B cable landfall envelope
- Teesside C&D cable landfall envelope
- Teesside A&B landfall construction envelope
- Teesside C&D landfall construction envelope
- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside C&D HVDC, Open trench
- Teesside C&D HVDC, HDD
- Teesside C&D HVAC, Open trench
- Teesside C&D HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside C&D major horizontal directional drill entry or exit locations (2,000m²)
- Teesside C&D minor horizontal directional drill entry or exit locations (1,200m²)
- HDD or open trench to be confirmed
- Teesside A&B cable route primary construction compound (10,000m²)
- Teesside C&D cable route primary construction compound (10,000m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside C&D intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside C&D converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Teesside C&D converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Tod Point 400kV substation
- Teesside A&B converter station site
- Teesside C&D converter station site

PROJECT TITLE

DOGGER BANK R3 DEVELOPMENT

DRAWING TITLE

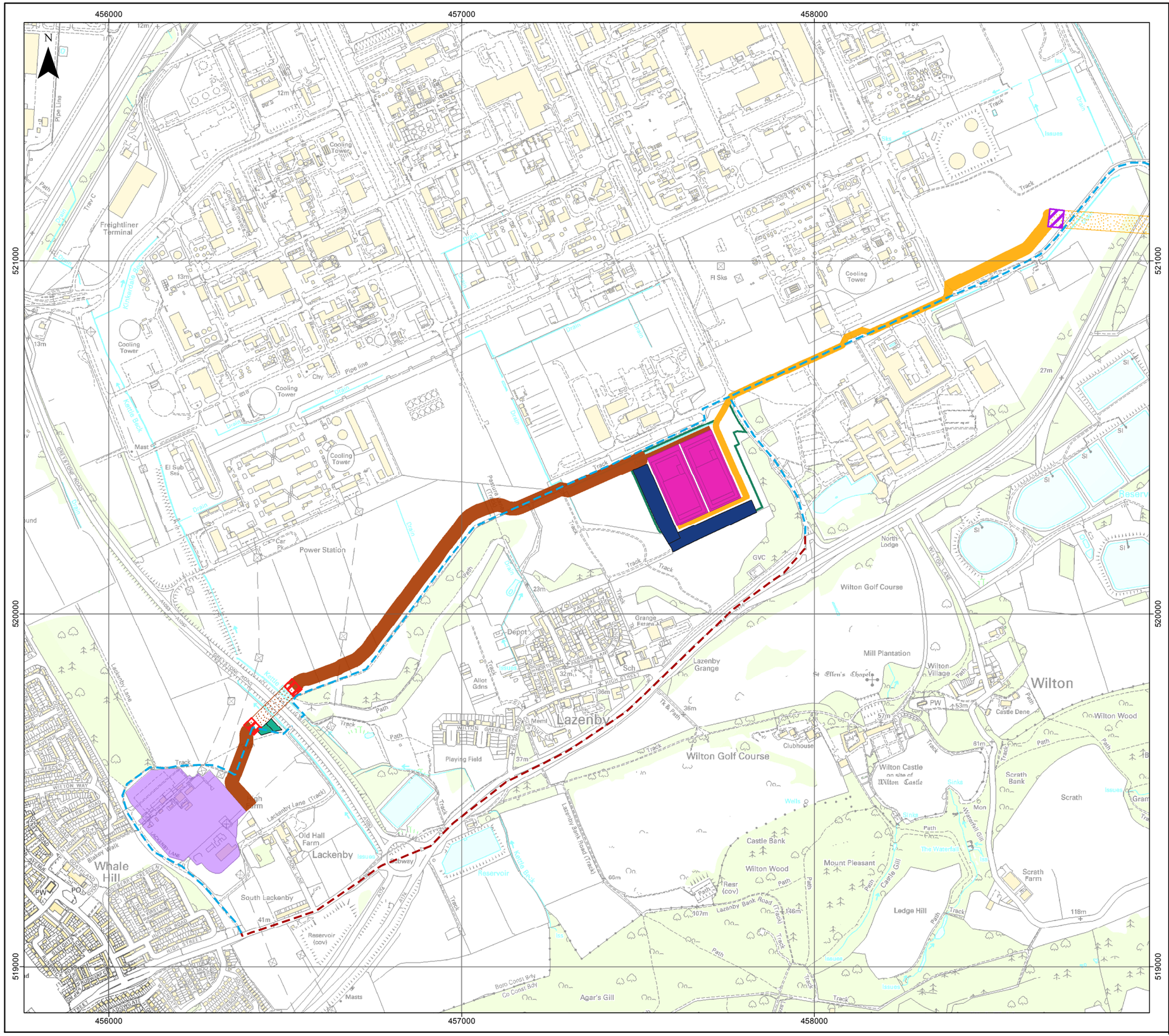
Figure 2: Dogger Bank Teesside A & B – Indicative Onshore Cable Route and Infrastructure

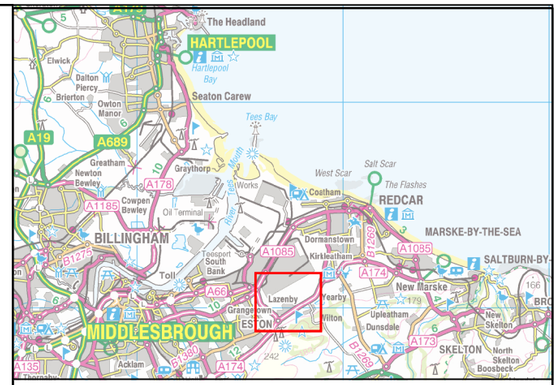
VER	DATE	REMARKS	Drawn	Checked
1	05/02/2014	CPD v6.1	SW	DW
2	11/02/2014	Pre-DCO submission review	LW	DW
3	19/02/2014	Pre-DCO submission review	LW	DW

DRAWING NUMBER: **T-DES-0160-01**

SCALE	1:28,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND





LEGEND

- Teesside A&B HVDC, Open trench
- Teesside A&B HVDC, HDD
- Teesside A&B HVAC, Open trench
- Teesside A&B HVAC, HDD
- Teesside A&B major horizontal directional drill entry or exit locations (2,000m²)
- Teesside A&B minor horizontal directional drill entry or exit locations (1,200m²)
- Teesside A&B intermediate construction compound (784m²)
- Teesside A&B converter stations
- Teesside A&B converter stations construction compounds (10,000m² per project)
- Lackenby 400kV substation
- Teesside A&B converter station site

Construction access roads

- Public Road
- Private Road / Track

0 250 500
Metres

Data Source:
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PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3:
Dogger Bank Teesside A & B – Wilton Complex Infrastructure

VER	DATE	REMARKS	Drawn	Checked
1	05/02/2014	CPD v6.1	SW	DW
2	11/02/2014	Pre-DCO submission review	LW	DW
4	07/03/2014	Pre-DCO submission review	LW	DW

DRAWING NUMBER:

T-DES-0145-01

SCALE	1:11,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND

Appendix B – Site Photos

East of the proposed converter stations site, looking from the Wilton Complex Access Road (Queens Avenue East)		Looking East from the west side of the proposed site.	
Looking North along Queens Ave East. The boundary fence on the left is the East boundary of the proposed site.		Existing Drainage ditch running west to east along Southway within the Wilton Complex.	

Site of the landfall between Marske-by-the-Sea and Redcar		Roger Dike at Longbeck Lane	

Appendix C – Stakeholder Consultation Responses

Graham, S.J. (Steve)

From: Daniel Woodward <Daniel.Woodward@nwl.co.uk>
Sent: 05 February 2013 10:33
To: Graham, S.J. (Steve)
Subject: RE: email 1 of 2 - Pre-planning enquiry for proposed development: Onshore Elements of the Dogger Bank Offshore Windfarm (Teesside Projects A & B)
Attachments: Wilton Works Flooding History Map.pdf; Mickle Dales Flooding History Map.pdf; Teesside A & B Development Flood History Map.pdf

Hi Steve

I have attached a copy of our sewer flooding records for the site. I have focused on the 2 construction areas labelled on your plan as well as attached a copy of the whole area and cable route.
As you can see there's no historic flooding that will affect your development only floods in nearby villages that we have records of. Please note this does not include any private drains & sewer flooding.

In relation to discharge rates unfortunately I am unable to help with this. To get this information I would advise you to contact our pre development enquiry team on 0191 419 6646. You may have to submit a pre development enquiry in order for NWL to model sewers in the vicinity to advise of any likely discharge rate restrictions & discharge points.

I hope this information is useful and if you have any questions please feel free to contact me.

Thanks

Daniel Woodward
New Development
Northumbrian Water
Tel: 0191 419 6731

From: Graham, S.J. (Steve) [mailto:steve.graham@rhdhv.com]
Sent: 04 February 2013 16:41
To: Daniel Woodward
Subject: RE: email 1 of 2 - Pre-planning enquiry for proposed development: Onshore Elements of the Dogger Bank Offshore Windfarm (Teesside Projects A & B)

Hi Daniel,

The Teesside A&B sites detailed at the Wilton Complex are the main onshore development sites in terms of actual installation construction so yes, this is the main focus of the FRA. However, I would certainly advocate 'the more the better' so if there is any known flood history in the general vicinity of the site that may have influenced the site in the past or likewise, along the cable route show on the plans, it would be greatly appreciated to inform the FRA.

Many thanks,
Steve

Steve Graham
Senior Consultant / Project Manager
Coastal & Rivers UK - Leeds
T +44 (0)113 388 4889 | **M** +44 (0)7855 450148 | **E** steve.graham@rhdhv.com | **W** www.royalhaskoningdhv.com

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From: Daniel Woodward [mailto:Daniel.Woodward@nwl.co.uk]
Sent: 04 February 2013 14:15
To: Graham, S.J. (Steve)

Subject: RE: email 1 of 2 - Pre-planning enquiry for proposed development: Onshore Elements of the Dogger Bank Offshore Windfarm (Teesside Projects A & B)

Hi Steve

Just reviewing the plans now.

What sites are you looking for the flood history for? Am I correct to say it is the 2 sites labelled "Teesside A & B"? Or do you need the history for more than this?

Thanks

Daniel Woodward
New Development
Northumbrian Water
Tel: 0191 419 6731

From: Graham, S.J. (Steve) [mailto:steve.graham@rhdhv.com]
Sent: 04 February 2013 11:45
To: Daniel Woodward
Cc: Henderson, R. (Ruth); Chris Gibbs (Chris.Gibbs@forewind.co.uk)
Subject: email 1 of 2 - Pre-planning enquiry for proposed development: Onshore Elements of the Dogger Bank Offshore Windfarm (Teesside Projects A & B)
Importance: High

Dear Daniel,

Following recent contact with one of your colleagues it was confirmed to me that you are the appropriate point of contact for this planning consultation. Please find attached a formal letter of consultation for the Onshore Elements of the Dogger Bank Offshore Windfarm (Teesside Projects A & B) and associated site information for your review (please note there is a second email to follow, keeping the email sizes below 10Mb).

I will attempt to give you a telephone call early this week to confirm the receipt of this consultation and discuss potential timescales for response. I do not intend to issue these in hardcopy format, however if you wish me to I will be happy to print and post, please let me know if this is desirable.

Many thanks in advance for your input,

Kind Regards,
Steve Graham

Steve Graham
Senior Consultant
Coastal & Rivers UK - Leeds

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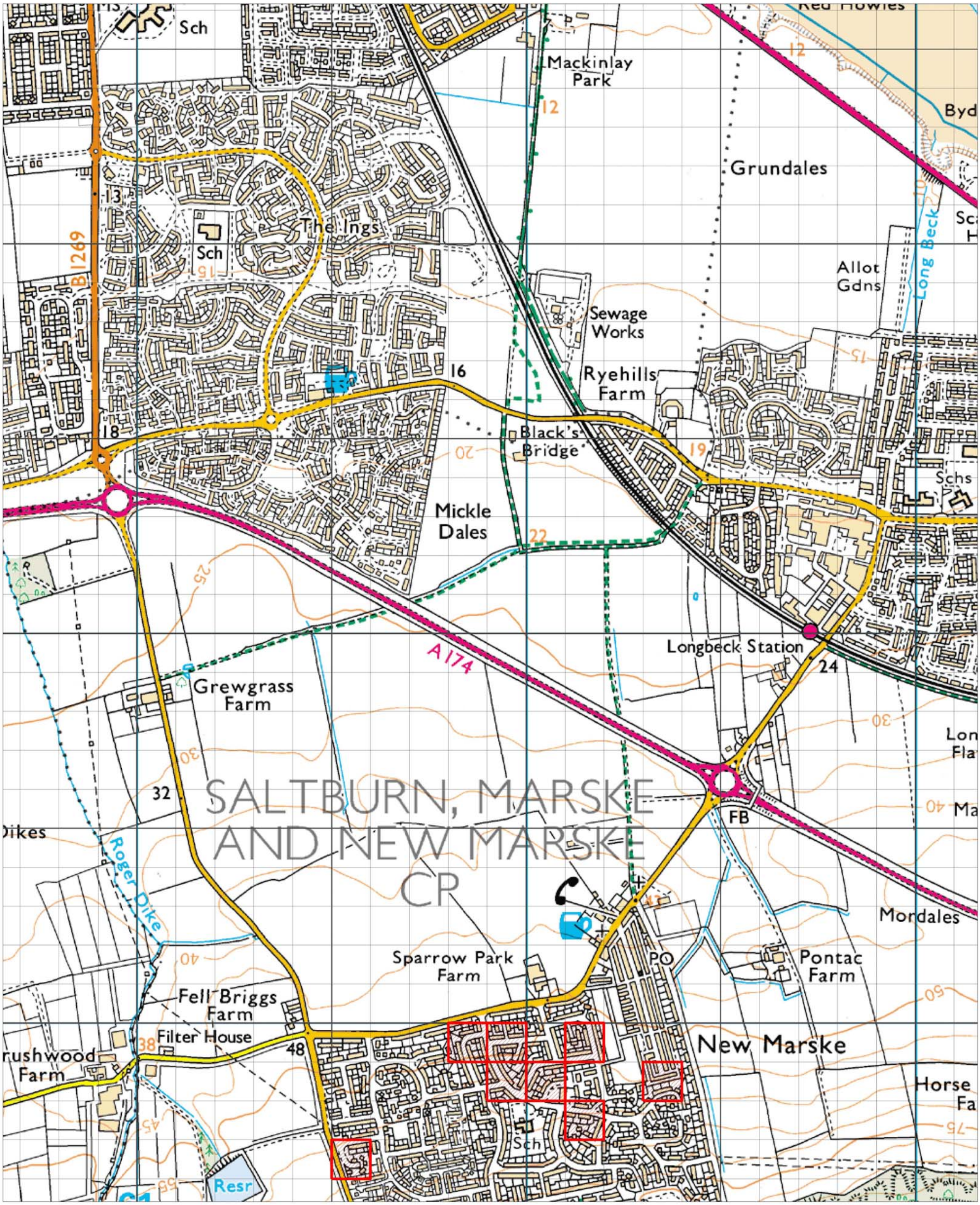
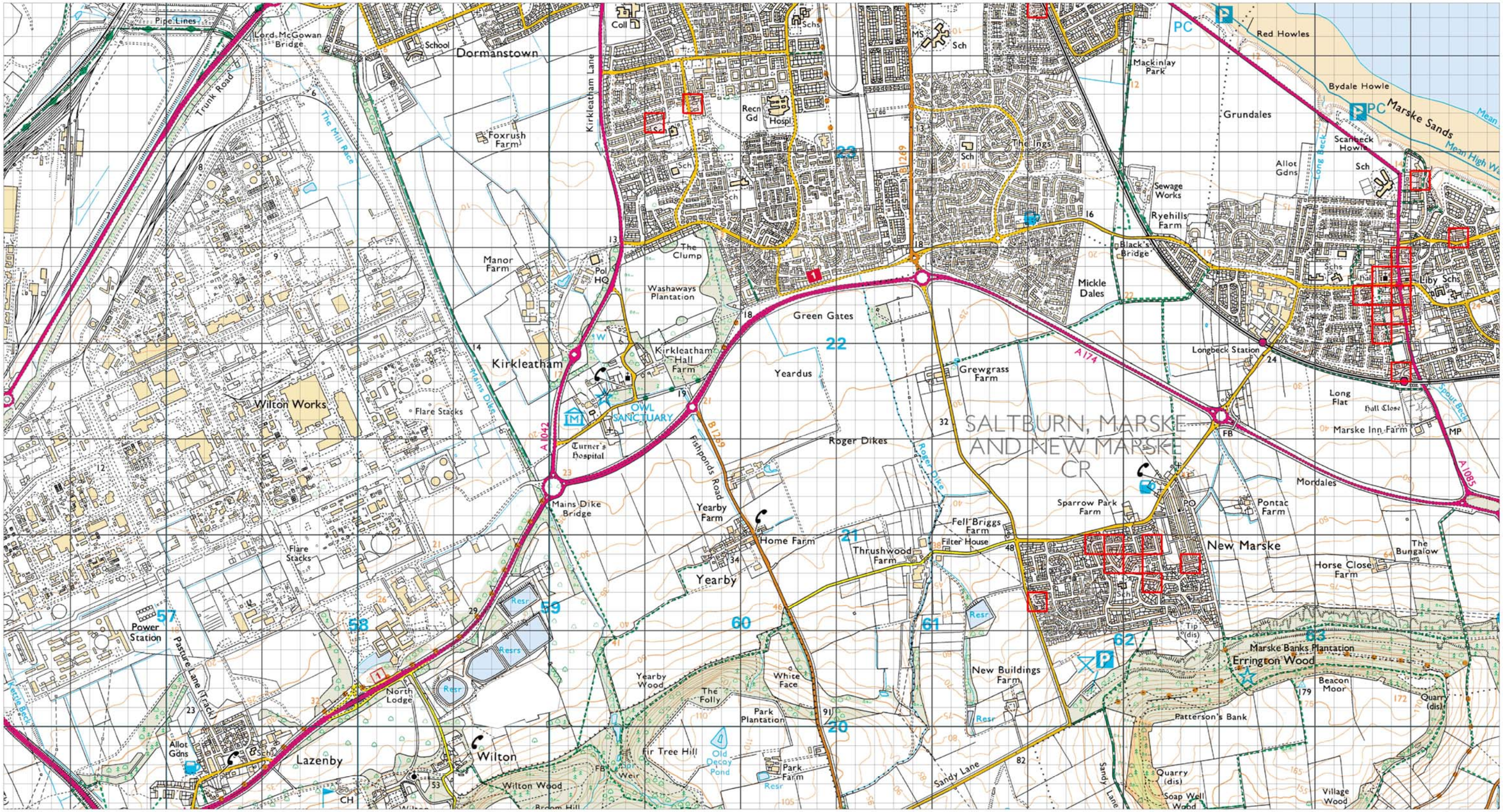


100m grid square where there has been reported sewer flooding.

100m grid square where there has been reported sewer flooding in an extreme event.

Author	: CAPEL	Date	: 05-02-2013
Title	:	Sheet:	NZ6122
Centre Point	: 461907,522079	Scale	: 1:4600

NORTHUMBRIAN WATER



100m grid square where there has been reported sewer flooding

100m grid square where there has been reported sewer flooding in an extreme event.

Author : CAPEL

Title :

Centre Point : 460058,521673

Date : 05-02-2013

Sheet : NZ6021

Scale : 1:7000

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