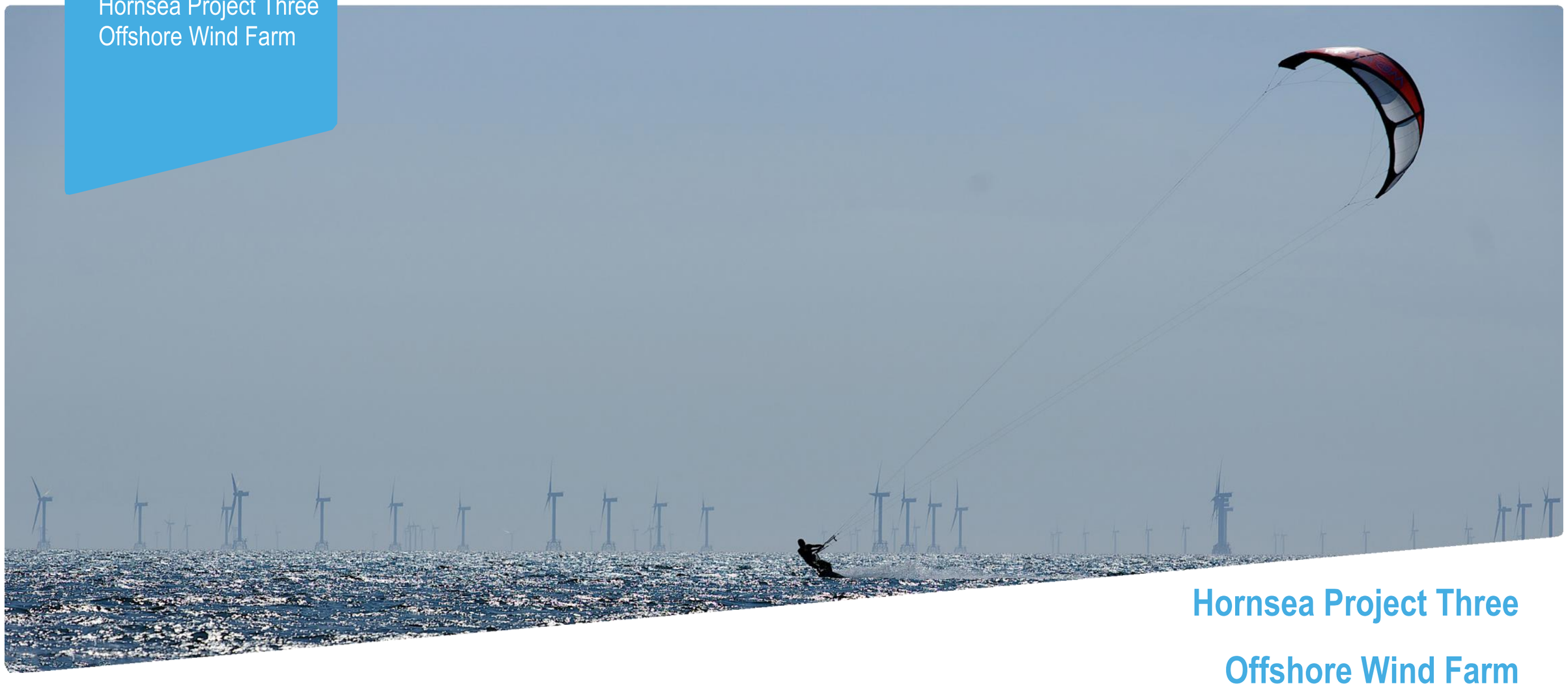
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Environmental Statement:
Volume 6, Annex 3.7 - Water Vole Survey

PINS Document Reference: A6.6.3.7
APFP Regulation 5(2)(a)

Date: May 2018

Hornsea 3
Offshore Wind Farm

Ørsted

Environmental Impact Assessment

Environmental Statement

Volume 6

Annex 3.7 - Water Vole Survey

Liability

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Report Number: A6.6.3.7

Version: Final

Date: May 2018

This report is also downloadable from the Hornsea Project Three offshore wind farm website at:
www.hornseaproject3.co.uk

Ørsted

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London, SW1P 1WG

Front cover picture: Kite surfer near a UK offshore wind farm © Orsted Hornsea Project Three (UK) Ltd, 2018.

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Glossary

Term	Definition
Compound	A collective term used to refer to secondary construction compounds along the onshore cable corridor as well as the landfall construction compound (defined in detail in volume 1, chapter 3: Project Description). Although, there is also a main construction compound, this is referred to individually due to its distant location relative to the onshore cable corridor.
Latrine	A location repeatedly visited for depositing droppings as a part of territorial behaviour.
Phase 1 Habitat Survey	A field survey technique which provides a relatively rapid system to record and map semi-natural vegetation and other wildlife habitats
Preliminary Ecological Appraisal	The first stage in any site ecological assessment. It has two main elements; an ecological desk study and an extended Phase 1 habitat survey.
Survey Area	The survey area for the water vole sign survey comprises the PEIR onshore cable corridor boundary and potential alternative routes with an additional survey buffer of 50 m (as shown on Figure 1.1).

Acronyms

Unit	Description
DCO	Development Consent Order
EIA	Environmental Impact Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest

Units

Unit	Description
GW	Gigawatt (power)
ha	Hectare (area)
m	Metre (distance)
km	Kilometre (distance)

1. Introduction

1.1 Development background

1.1.1.1 Ørsted is promoting an application for a development consent order ('DCO') for the Hornsea Project Three Offshore Wind Farm (hereafter referred to as 'Hornsea Three') a proposed offshore wind farm located in the southern North Sea. This report focuses on the onshore components of Hornsea Three (as described in volume 1, chapter 3: Project Description).

1.1.1.2 At the time of ecological survey scoping in December 2016, a 200 m wide cable corridor search area had been identified by Ørsted. The 200 m wide search area included the locations of the proposed onshore cable corridor, HVAC booster station, HVDC converter/HVAC substation, Norwich main national grid substation and construction compounds and was the focus of the Preliminary Environmental Information Report (PEIR) submitted in July 2017. This search area is hereafter referred to as the 'PEIR onshore cable corridor search area'. Following this, some alternate route considerations were added. Ecological survey area boundaries were based on the PEIR onshore cable corridor search area and alternate routes considered, with an appropriate survey buffer added for some survey types where necessary. The survey area applicable to this report is shown in Appendix A, Figure 1.1.

1.1.1.3 Subsequently, a route refinement process has been undertaken to refine the Hornsea Three onshore cable corridor to an approximately 80 m wide corridor (referred to as the 'onshore cable corridor') as well as identify locations of compounds, access roads and storage areas. The location of permanent and temporary land take associated with the HVDC converter/HVAC substation and HVAC booster station has also been refined. This process is described in more detail in volume 1, chapter 4: Site Selection and Alternatives of volume 1 of the Environmental Statement.

1.1.1.4 A full description of Hornsea Three is provided in volume 1, chapter 3: Project Description.

1.2 Ecology background

1.2.1.1 A Preliminary Ecological Appraisal (PEA) of the onshore components of Hornsea Three was undertaken in 2016 (RPS, 2016). This included a Phase 1 habitat survey of an area comprising a 500 m wide corridor (including the PEIR onshore cable corridor search area) and an ecological desk study, whereby protected species data was requested from the Norfolk Biodiversity Information Service (NBIS).

1.2.1.2 Subsequently, a second Phase 1 habitat survey was undertaken to cover 30 areas which were either not accessible during the PEA, or became relevant to Hornsea Three due to design refinements (see volume 6, annex 3.1 of the Environmental Statement).

1.2.1.3 Records of water vole (*Arviocola amphibious*) were returned as part of the desk study and the PEA identified suitable terrestrial and aquatic habitat within the Phase 1 survey area, including within the PEIR onshore cable corridor search area (no additional suitable habitat was identified during the second Phase 1 habitat survey, see volume 6, annex 3.1).

1.2.1.4 The results of the PEA have therefore been used to inform the scope and extent of the water vole surveys which are the focus of this report.

1.3 Legislative background

1.3.1.1 Since 6 April 2008, water voles have been fully protected under the Wildlife and Countryside Act, 1981, as amended. This makes it an offence to intentionally or recklessly:

- Kill, injure or take from the wild a water vole;
- Possess or trade a water vole;
- Damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection; and, or
- Disturb water voles while they are using such a place.

1.3.1.2 In practice, legal protection requires that due attention is paid to the presence of water voles, and that appropriate actions are taken to safeguard not only individual animals but also the places they use for shelter or protection. In order for water voles, or their burrows, to be removed from a proposed development site legally, mitigation should be agreed with relevant parties prior to commencement of works.

1.3.1.3 The water vole has been adopted as a Species of Principal Importance for the Conservation of Biodiversity in England. This places a duty on all government departments to have regard for the conservation of these species and on the Secretary of State to further, or promote others to further, the conservation of these species. Furthermore, the National Planning Policy Framework (2012) states that local planning authorities should promote the protection and recovery of priority species populations linked to national and local targets, which presumably means those listed under the Section 41 of the NERC Act, the former UK BAP and on Local or Regional priorities species lists.

1.4 The brief and objectives

1.4.1.1 The brief of the survey was to:

- Undertake surveys of potential water vole habitat that was identified within the PEA and has the potential to be impacted by Hornsea Three; and

- Provide a survey report to include methods and results of water vole surveys as well as associated digital mapping.

1.4.1.2 The objective of the survey was to identify the presence of water vole populations within the survey area, and more specifically within the onshore cable corridor, to enable an assessment of the potential impacts of Hornsea Three on this species within volume 3, chapter 3: Ecology and Nature Conservation.

2. Methodology

2.1 Survey area

2.1.1.1 The survey area for the water vole sign survey comprised the PEIR onshore cable corridor area and potential alternative routes, as shown on Appendix A, Figure 1.1, with an additional survey buffer of 50 m in accordance with best practice guidance (Strachan, Moorhouse & Gelling, 2011). The specific location of waterbodies to be surveyed was identified based on a review of the PEA (RPS, 2016) and is shown on Appendix A, Figure 2.1 to 2.19.

2.1.1.2 Sources used to identify waterbodies requiring survey were the PEA (RPS, 2016), publically available aerial photography and Ordnance Survey mapping. Although there is the potential that some small waterbodies, such as private ponds, may not have been identified from the existing data, any new waterbodies which were identified during site visits and previous great crested newt (*Triturus cristatus*) surveys were subsequently mapped and where required, surveys undertaken.

2.1.1.3 The main construction compound to the east of the Hornsea Three onshore cable corridor is outside of the survey area for this study and comprises existing hard standing with negligible ecological importance. Therefore, a detailed survey of baseline conditions was not required.

2.2 Survey method

2.2.1.1 To assist in reporting, each waterbody was given a unique identification code[1].

2.2.1.2 Although 52 waterbodies were identified as requiring survey, a total of 48 waterbodies were visited during the survey. They were surveyed by suitably experienced ecologists, working in pairs, who walked the banks of the waterbody within the survey area searching for signs of water vole. The survey visits were undertaken between 4 April and 23 August 2017.

2.2.1.3 Field signs searched for during the survey included the following:

- Water vole burrows in the banks;
- Water vole nests in dense vegetation;
- Water vole faeces and latrines;
- Water vole pathways and footprints along the banks;
- Feeding stations with fragments of partially eaten vegetation; and
- Grazed ‘lawns’ which water voles may create around their burrow entrances.

[1] It is noted that waterbody identification codes are not continuous due to survey boundary changes between original numbering of the waterbodies and finalisation of this report.

2.2.1.4 The location of water vole sightings and signs were recorded on a GPS enabled mobile mapping device and geo-referenced photographs were taken of each waterbody. In addition, any evidence of American mink (*Mustela vison*), including sightings, footprints and faeces, were also recorded. American mink are known to predate water voles and can cause extinction of water vole populations, information on the presence of American mink can be useful in determining why water vole populations are absent from suitable habitat and in formulating mitigation measures.

2.3 Surveyors

2.3.1.1 Surveys were undertaken by the following suitably qualified and experienced ecologists: Ishbel Campbell BSc (Hons) MSc ACIEEM; Karen Akehurst BSc (Hons) MSc GradCIEEM; Lauren Hornsby BSc (Hons); Louise Bunn BSc (Hons) MSc ACIEEM; Rhiannon Williams BSc (Hons) MRes GradCIEEM; Robert Allen BSc (Hons) MSc GradCIEEM; Caroline Ritchie BSc (Hons) MSc; Joseph Baker BSc (Hons); Mercedes Malax-Echevarria BSc (Hons); Neil Whitehead BSc (Hons) MSc; Stephen Hewitt Bsc (Hons) ACIEEM.

2.4 Limitations

2.4.1.1 The survey area for this study was based on the PEIR onshore cable corridor search area and some alternate route options considered after issue of the PEIR, with an additional survey buffer of 50 m. Following completion of the survey, the refinement of the onshore cable corridor, main and secondary construction compounds, access roads and storage areas were finalised. At some locations the finalised cable corridor and associated infrastructure fall outside of the survey area. As these areas were identified outside of the survey season it was not possible to undertake water vole surveys in these areas, which amount to 38.56 ha (7.25%) of the onshore cable corridor and associated infrastructure area).

2.4.1.2 Landowner permission was required to undertake field surveys within the survey area identified. The status of landowner permission to access survey areas was reviewed on a weekly basis during the survey season. However, land access permission was not available for four of the 52 waterbodies identified for survey. A further three waterbodies could not be fully accessed due to dense vegetation or health and safety concerns (e.g. access to islands surrounded by water or waterbodies surrounded by dense or unsafe vegetation). Table 2.1 lists waterbodies with no access or only partial access within the water vole survey area, no access areas are shown on Appendix A, Figure 2.1 to 2.19 (relative to the survey area and onshore cable corridor).

Table 2.1: List of waterbodies with no access or only partial access.

Waterbody Number	Access Status	Figure Number (Appendix A)
WA9	Partial access	2.1
WE1	Partial access	2.9
WE2	Partial access	2.9
WE12	No access	2.11
WF2	No access	2.12
WG3	No access	2.19
WG7	No access	2.19

2.4.1.3 Although it was not possible to survey the areas listed above in 2017, they were mostly covered by the PEA (RPS, 2016) providing ecological data on habitat types and species desk study records, which combined with the ability to characterise from the large volume of data collected in the remainder of the survey area, is considered sufficient to inform the impact assessment reported in volume 3, chapter 3: Ecology and Nature Conservation of the Environmental Statement. It is assumed that water vole will be present where suitable habitat exists, where desk study records and/or survey information from other parts of the route indicate likely presence.

2.4.1.4 The areas where survey could not be completed but that will be impacted by Hornsea Three, will be checked during pre-construction surveys enabling amendment of mitigation or the application of further mitigation, to that specified in volume 3, chapter 3: Ecology and Nature Conservation of the Environmental Statement.

3. Results

3.1.1.1 Of the 48 waterbodies that were surveyed, water vole field signs were recorded at 17 waterbodies. The water vole signs recorded and a description of those waterbodies where water voles were recorded to be present are shown on Table 3.2. The location of surveyed waterbodies and results of the water vole sign survey are shown on Appendix A, Figure 2.1 to 2.19 whilst photographs of each waterbody are provided in Figure 3.1 to 3.3. Habitat parameters for all waterbodies surveyed are given in Appendix B.

3.1.1.2 There were three records or reports of American mink recorded during survey either from talking with landowners or recording presence of mink rafts nearby. Details of these are given below in Table 3.1.

Table 3.1: Signs of American mink recorded.

Waterbody ID	Figure number	Waterbody type	Mink signs recorded
WE4	2.10	Ditch	Landowner confirmed presence of mink
WE7	2.10	Ditch	Mink trapping in progress in the area
WF6	2.13	Ditch	Landowner confirmed presence of mink

3.1.1.3 The presence of American mink in the area is significant because it is known that American mink have caused a sharp decline in water vole populations in Britain due to predation (Strachan, Strachan & Jefferies, 2000). Therefore, in these waterbodies it is likely that the water vole population is small if present at all. From these three waterbodies, two (WE4 and WF6) did record water vole footprints showing that the water vole population and American mink population overlap. The remaining site (WE7) could not be accessed and so it is unknown whether water voles are present.

Table 3.2: Water vole survey results and waterbody descriptions.

Waterbody ID	Figure No. Photo No. (Appendix A)	Waterbody Description	Water Vole Signs Recorded
WA11 Pond	Fig. 2.1 Photo 1 - Fig. 3.1	A pond and reed bed with still water approximately 5 m wide and no more than 1 m deep. Edges of waterbody are vertical earth banks. It is surrounded by improved grassland with low human disturbance and moderate animal disturbance.	Water Vole Latrine Water Vole Feeding Station (x3) Water Vole Pathway Water Vole Faeces
WB5 Pond	Fig. 2.2 Photo 2 - Fig. 3.1	A still pond up to 20 m wide and no more than 1 m deep. Edges of waterbody are a steep silt like substrate. It is surrounded by arable fields with low human disturbance.	Water Vole Latrine
WC2 Pond	Fig. 2.4 Photo 3 - Fig. 3.1	A still pond larger than 40 m wide and likely more than 2 m deep. Edges of waterbody are a vertical gravel like substrate. It is surrounded by broadleaved woodland with no human or animal disturbance.	Water Vole Burrow
WC8 Ditch	Fig. 2.6 Photo 4 - Fig. 3.1	A slow flowing ditch approximately 1 m wide and less than 0.5 m deep. Edges of waterbody are a steep silt like substrate. It is surrounded by arable fields with low human disturbance.	Water Vole Footprint (x3) Water Vole Faeces (x2) Water Vole Burrow (x5)
WC9 Ditch	Fig. 2.6 Photo 5 - Fig. 3.1	A slow flowing ditch approximately 1 m wide and less than 0.5 m deep. Edges of waterbody are a steep silt like substrate. It is surrounded by arable fields with low human disturbance.	Water Vole Burrow Water Vole Footprint (x2)
WC10 Pond	Fig. 2.7 Photo 6 - Fig. 3.1	A still pond between 10-20 m wide and approximately 1-2 m deep. Edges of waterbody are a steep earth like substrate. It is surrounded by arable fields with moderate human disturbance.	Water Vole Burrow
WC11 Ditch	Fig. 2.4 Photo 7 - Fig. 3.2	A still ditch approximately 2 m wide and 0.5 m deep. Edges of waterbody are a shallow earthy substrate. It is surrounded by improved grassland with a low human disturbance.	Water Vole Faeces
WD1 Stream	Fig. 2.8 Photo 8 - Fig. 3.2	Moderately running water approximately 2 m wide and no more than 1 m deep. Edges of waterbody are vertical and consist of a silty substrate. It is surrounded by broadleaved woodland with low human disturbance.	Water Vole Footprint (x2) Water Vole Burrow
WE4 Ditch	Fig. 2.10 Photo 9 - Fig. 3.2	A slow flowing ditch between 2 m wide and less than 0.5 m deep. Edges of waterbody are a vertical silt like substrate. It is surrounded by arable fields with low human disturbance.	Water Vole Footprint
WF5 River Yare	Fig. 2.13 Photo 10 - Fig. 3.2	River Yare - Moderately running water approximately 5 m wide and likely more than 2 m deep. Edges of waterbody are a vertical gravel like substrate. It is surrounded by improved grassland with low human disturbance and moderate farm animal disturbance.	Water Vole Burrow Water Vole Footprint (x3)
WF6 Ditch	Fig. 2.13 Photo 11 - Fig. 3.2	A still ditch approximately 2 m wide and no more than 0.5 m deep. Edges of waterbody are a shallow silt like substrate. It is surrounded by improved grassland with low human disturbance and low farm animal disturbance.	Water Vole Footprint
WF9 Stream	Fig. 2.14 Photo 12 - Fig. 3.2	Slow running water approximately 1 m wide and no more than 0.5 m deep. Edges of waterbody are a flat gravel like substrate. It is surrounded by improved grassland with low human disturbance and moderate farm animal disturbance.	Water Vole Footprint (x2) Water Vole Feeding Station
WF20 Stream	Fig. 2.16 Photo 13 - Fig. 3.3	Slow running water approximately 1 m wide and no more than 0.5 m deep. Edges of waterbody are a shallow silt like substrate. It is surrounded by arable fields with high human disturbance.	Water Vole Faeces (x2) Water Vole Burrow (x3)

Waterbody ID	Figure No. Photo No. (Appendix A)	Waterbody Description	Water Vole Signs Recorded
WF21 Stream	Fig. 2.16 Photo 14 - Fig. 3.3	Moderately running water approximately 1 m wide and no more than 0.5 m deep. Edges of waterbody are shallow. It is surrounded by arable fields with moderate human disturbance and low farm animal disturbance.	Water Vole Burrow Water Vole Faeces
WG2 Stream	Fig. 2.18 Photo 15 - Fig. 3.3	Moderately running water approximately 1 m wide and no more than 0.5 m deep. Edges of waterbody are steep and consist of an earthy substrate. It is surrounded by arable fields with low human disturbance and high farm animal disturbance.	Water Vole Burrow (x4) Actual Resting Site
WG5 Stream	Fig. 2.18 Photo 16 - Fig. 3.3	Slow running water approximately 1.5 m wide and no more than 0.5 m deep. A Mesotrophic waterbody with a gravel like substrate. Surrounded by improved grasslands with a moderate level of human disturbance.	Sighting

4. Conclusion

4.1.1.1 The water vole sign survey confirmed the presence of water vole at 17 waterbodies distributed along the length of the survey area. Thirty-two waterbodies surveyed showed no signs of water vole presence.

4.1.1.2 Four of the waterbodies (WC9, WC8, WD1, WF21) which recorded presence of water vole were located within the onshore cable corridor and a further five waterbodies (WC3, WC4, WF5, WG2, WG5) that intercept the onshore cable corridor recorded signs of water vole although do not necessarily have presence records inside the corridor.

4.1.1.3 The invasive American mink was reported to be present nearby to three waterbodies, two of which overlapped with water vole presence.

4.1.1.4 Results of the survey have been used to inform the final location and design of the onshore components of Hornsea Three (see volume 1, chapter 4: Site Selection and Alternatives) and to enable the assessment of the potential impacts on ecology and nature conservation, reported in volume 3, chapter 3: Ecology and Nature Conservation.

5. References

HM Government (2006) Natural Environment and Rural Communities Act.

HM Government (1981) Wildlife and Countryside Act.

National Planning Policy Framework (NPPF) (2012).

RPS (2016) Hornsea Three Preliminary Ecological Appraisal.

Strachan, R., Moorhouse, M. & Gelling, M. (2011) Water Vole Conservation Handbook. Wildlife Conservation Research Unit.

Strachan. C., Strachan, R. & Jeffries, D.J. (2000) Preliminary report on the changes in the water vole population of Britain as shown by the national surveys of 1989-90 and 1996-98. The Vincent Wildlife Trust. London.

Appendix A Figures

A.1 Water vole survey area.

It is drawn to the readers attention that the survey area depicted in this figure is not representative of the final project boundary. The relationship between the final project boundary and the survey area, as well as any implications for the baseline information as it relates to the EIA is discussed in the limitations section of this annex (see Section 2).

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Projection : BNG

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Vertical reference: Newlyn

0 1 2 Kilometres

REV	REMARK	DATE
01	Initial Issue	25/08/2017

Hornsea Project Three
Figure 1.1:
Water Vole Survey Area

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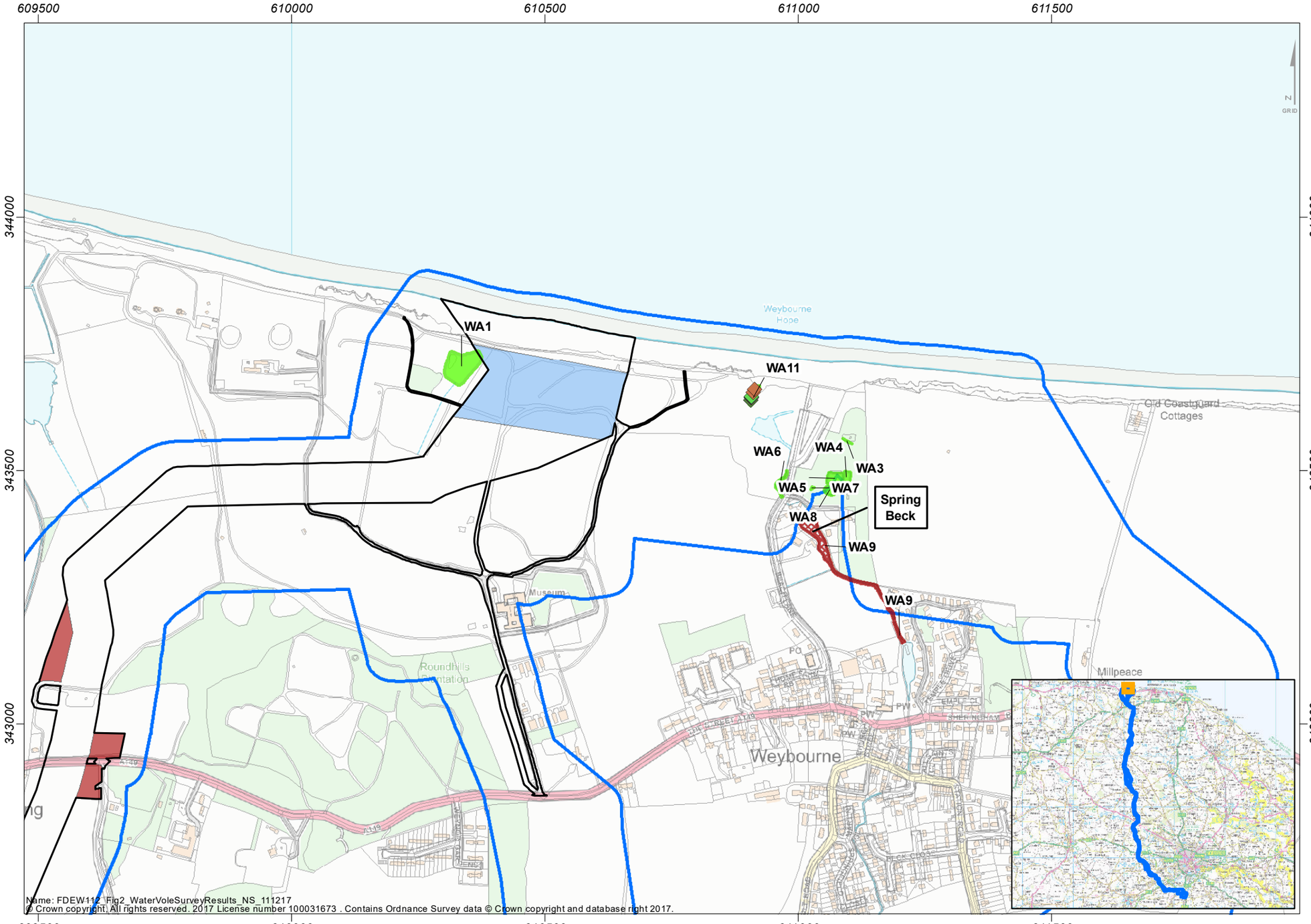
Created by: DJ
Checked by: NS
Approved by:NS

RPS Ørsted

A.2 Water vole survey results.



Water Vole Sign

- Water Vole Faeces
- Water Vole Feeding Station
- Water Vole Latrine
- Water Vole Pathway

Water Vole Waterbody Survey Status

- Surveyed
- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Landfall Construction Compound
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

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REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.1
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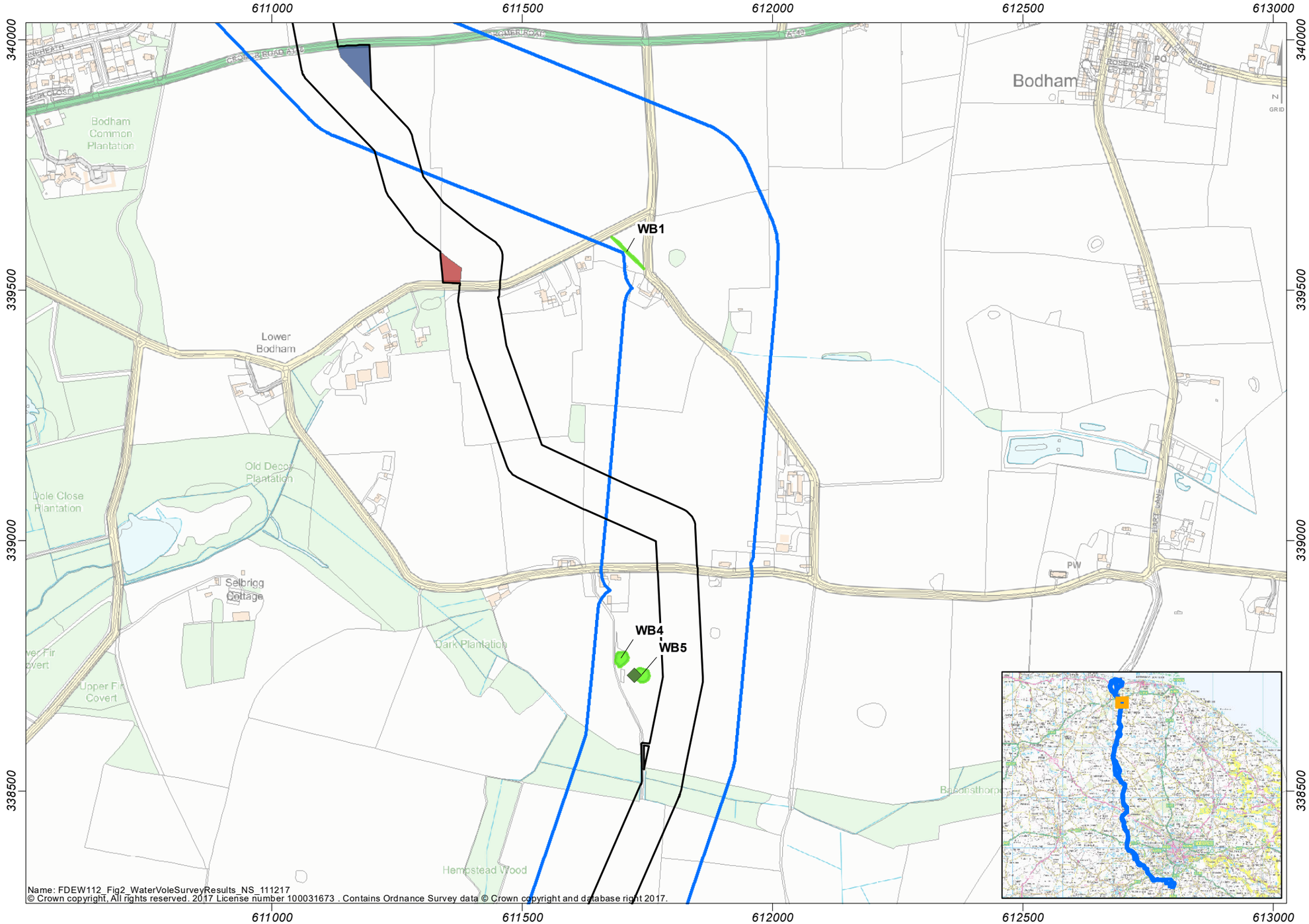

Water Vole Sign

- Water Vole Latrine

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Compound
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

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REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
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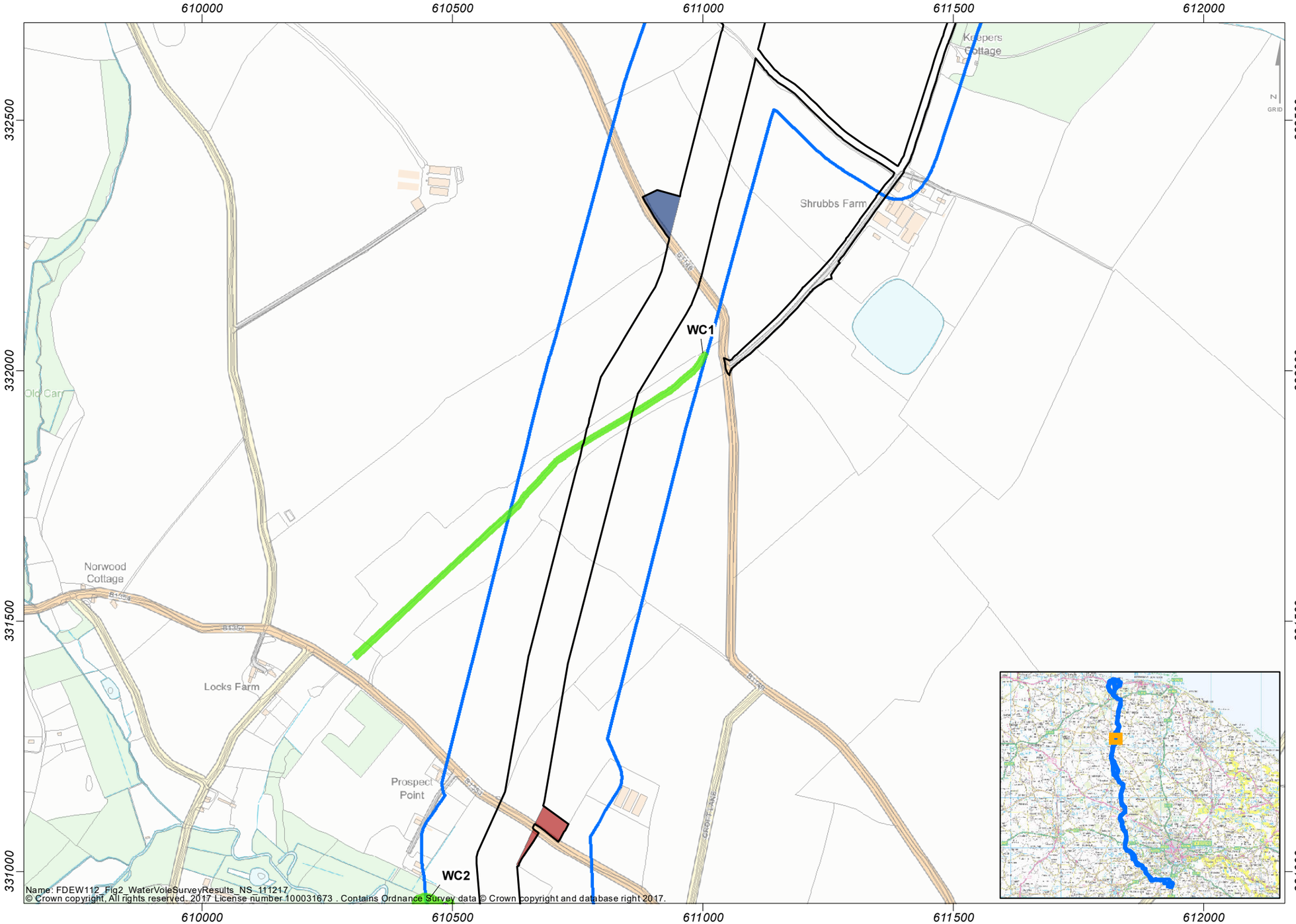

Water Vole Sign

- Water Vole Burrow

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Compound
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

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REV	REMARK	DATE
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Hornsea Project Three
Figure: 2.3
Water Vole Survey Results.

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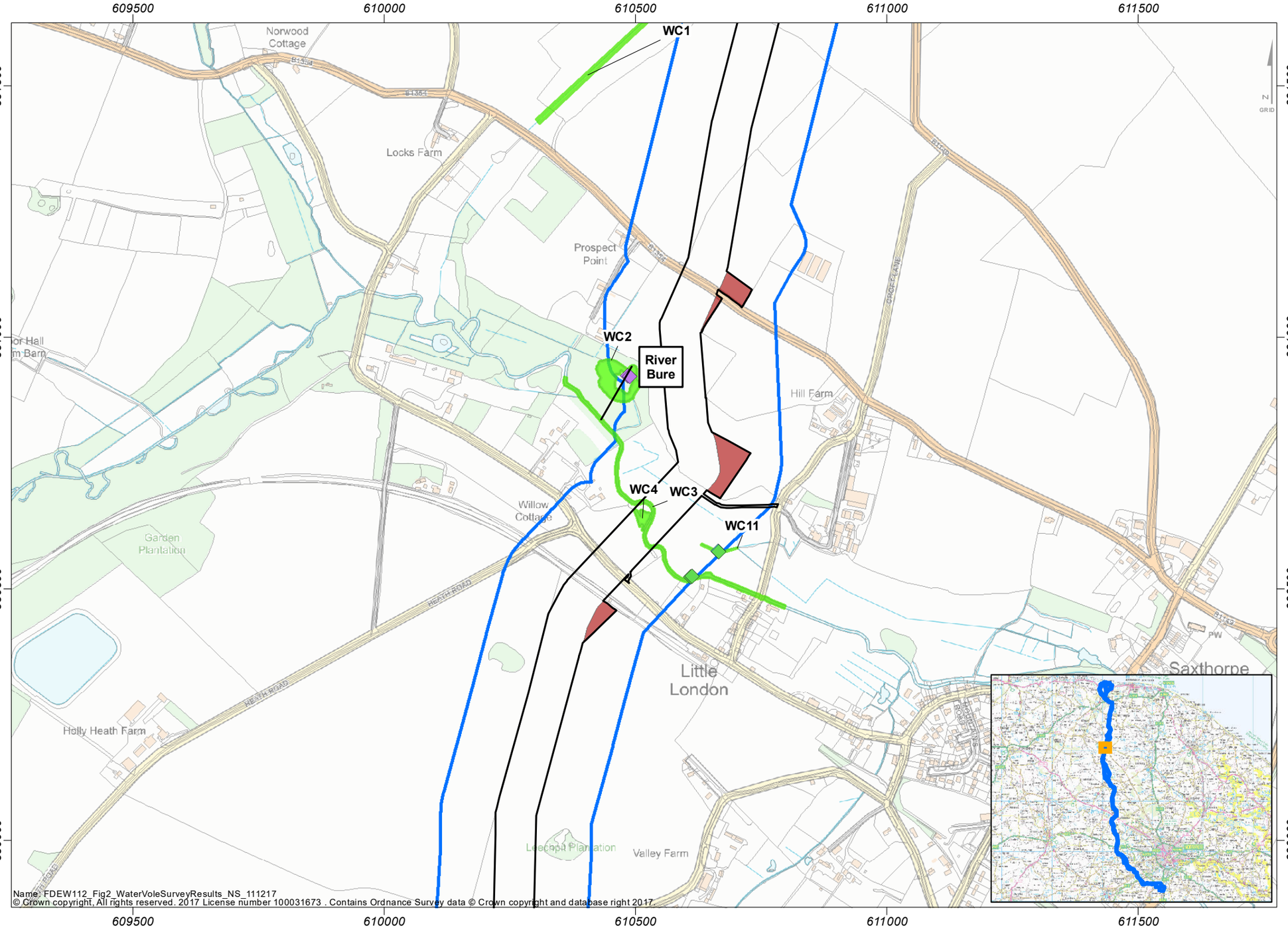

Water Vole Sign

- Water Vole Burrow
- Water Vole Faeces
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

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REV	REMARK	DATE
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Hornsea Project Three
Figure: 2.4
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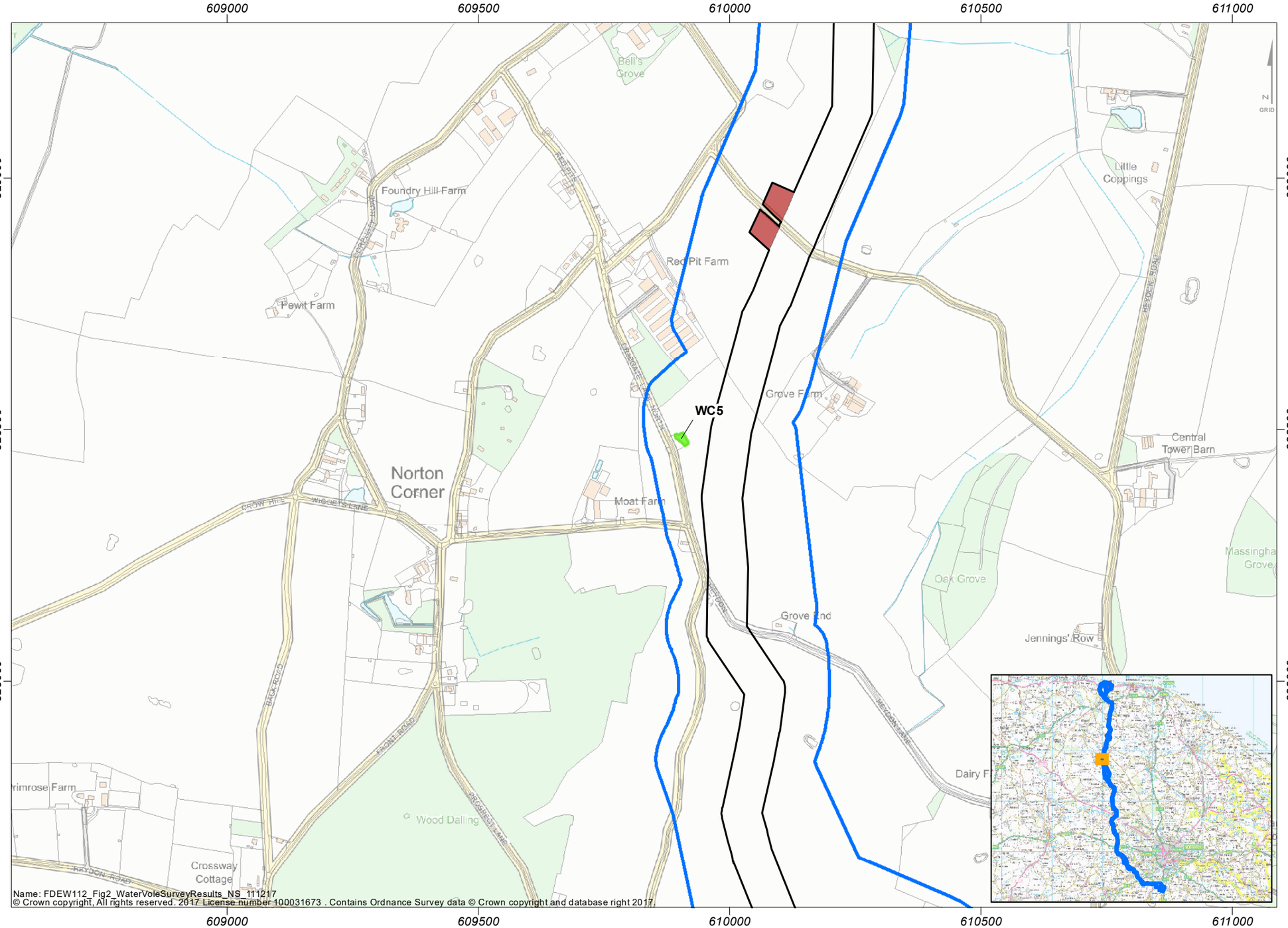

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
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REV	REMARK	DATE
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Hornsea Project Three
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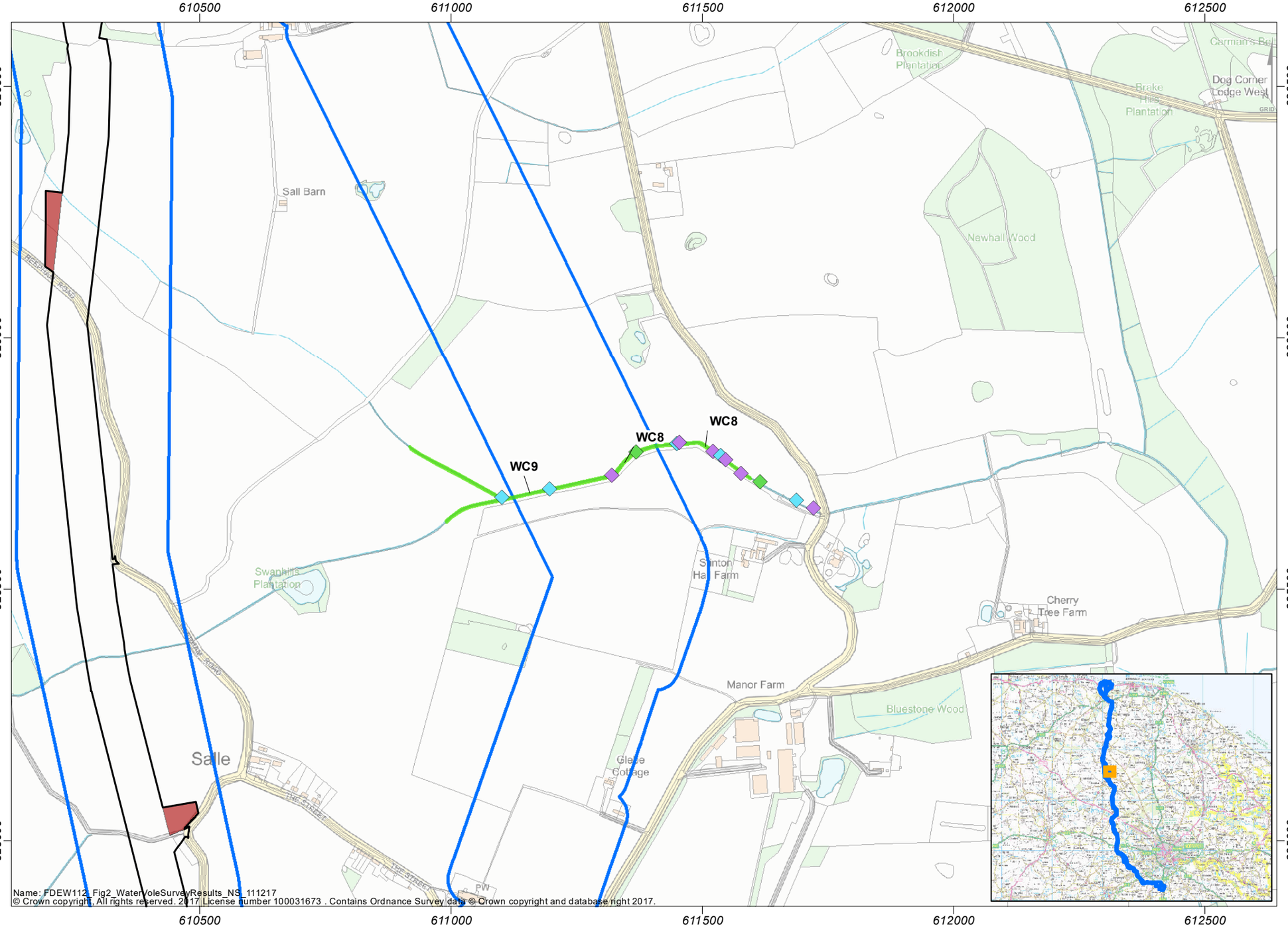

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Water Vole Sign

- Water Vole Burrow
- Water Vole Faeces
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
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REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
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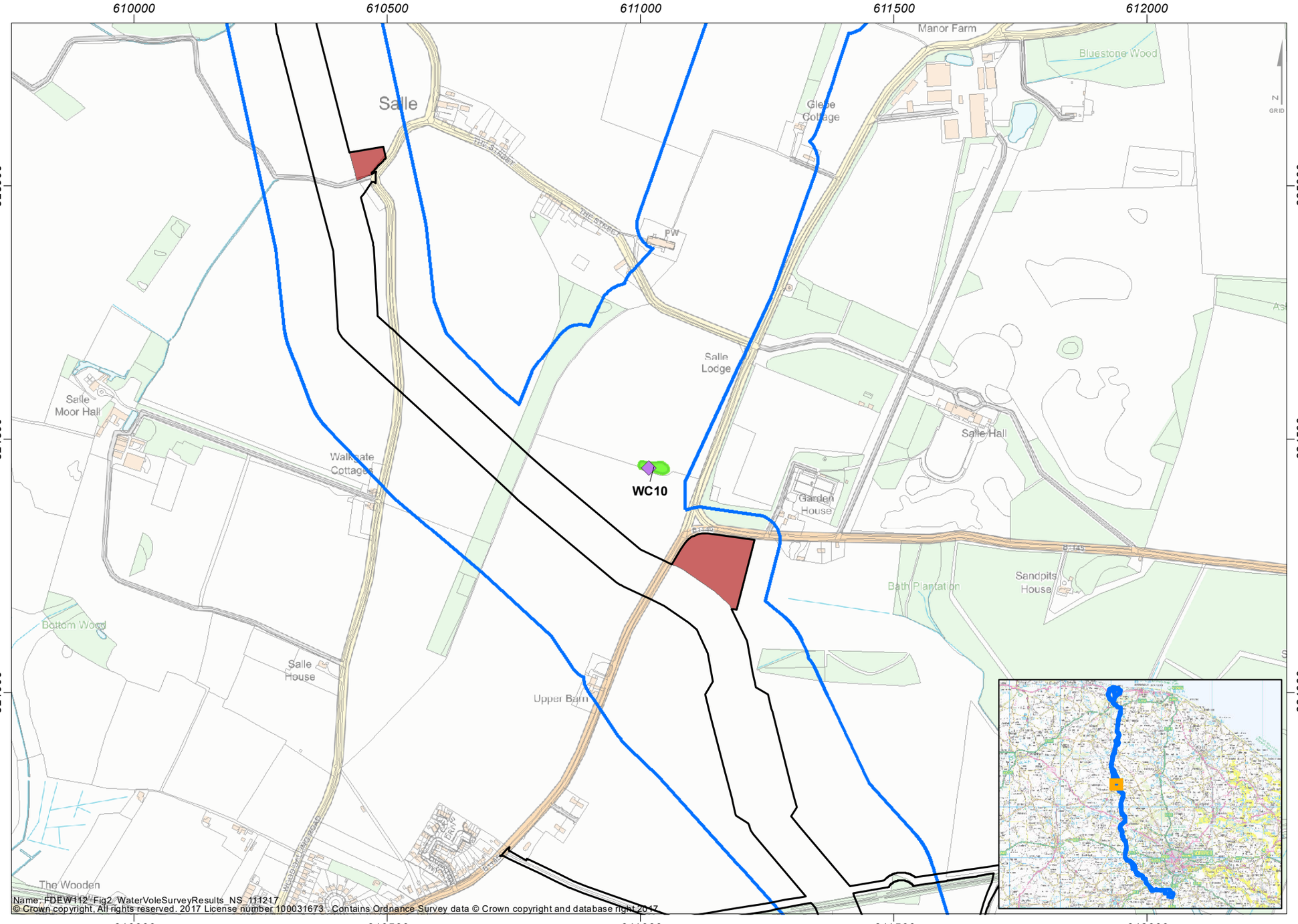


Name: FDEW112_Fig2_WaterVoleSurveyResults_NS_111217

Water Vole Sign

- Water Vole Burrow

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

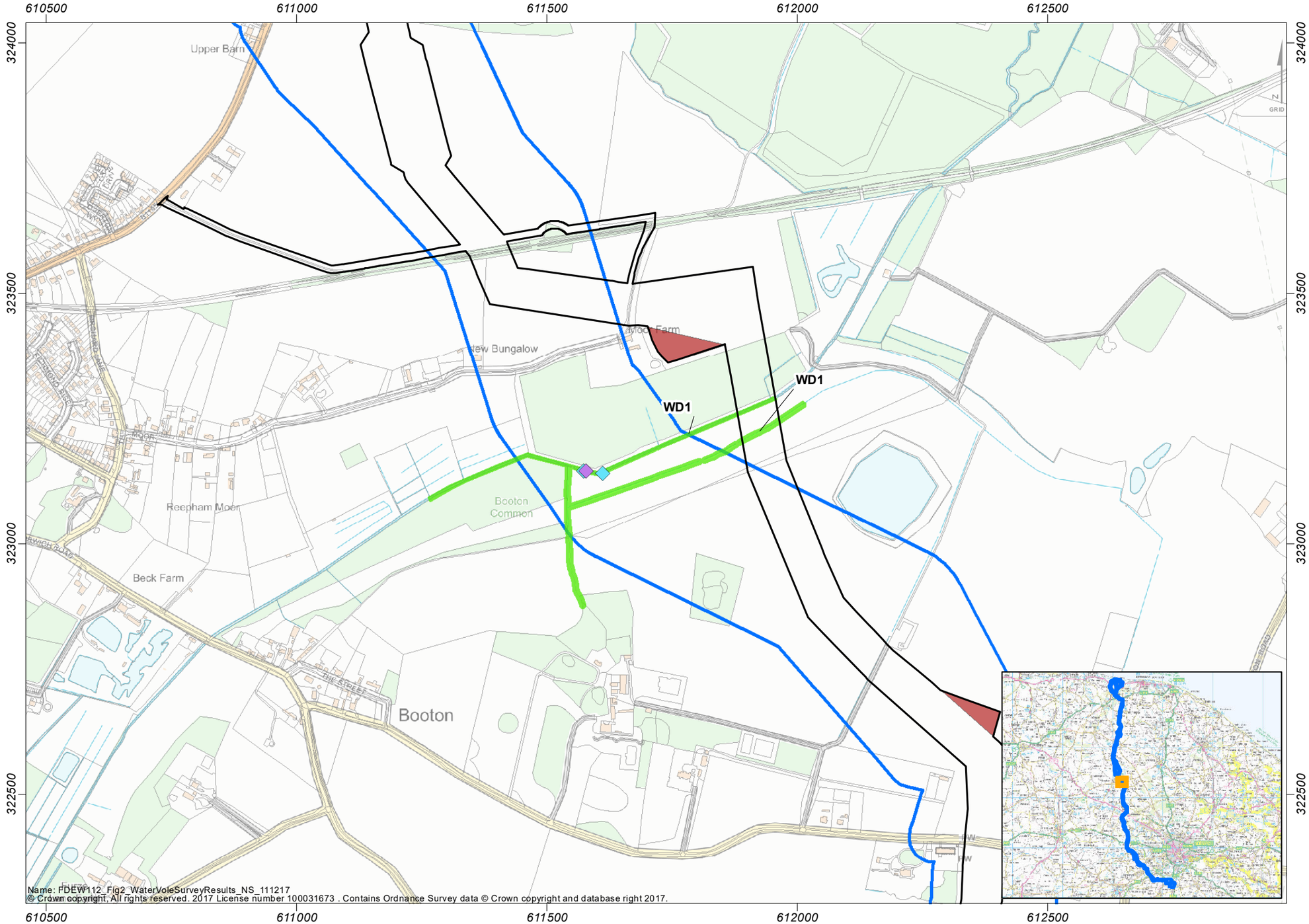
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.7
Water Vole Survey Results.

Doc no: FDEW112/24198/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Name: FDEW112_Fig2_WaterVoleSurveyResults_NS_111217

Water Vole Sign

- Water Vole Burrow
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

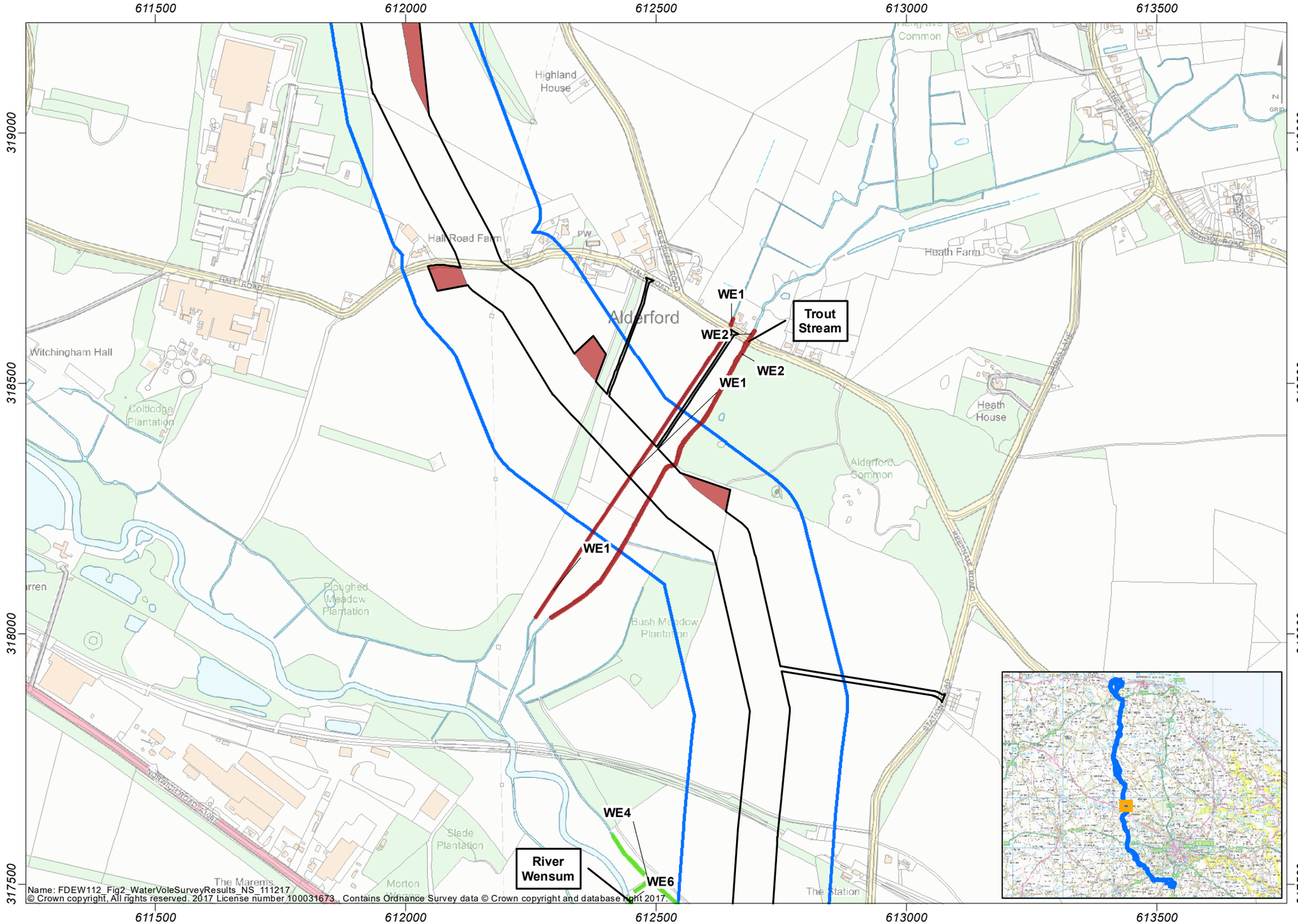
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.8
Water Vole Survey Results.

Doc no: FDEW112/24199/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Name: FDEW112_Fig2_WaterVoleSurveyResults_NS_111217

Water Vole Waterbody Survey Status

- Surveyed
- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

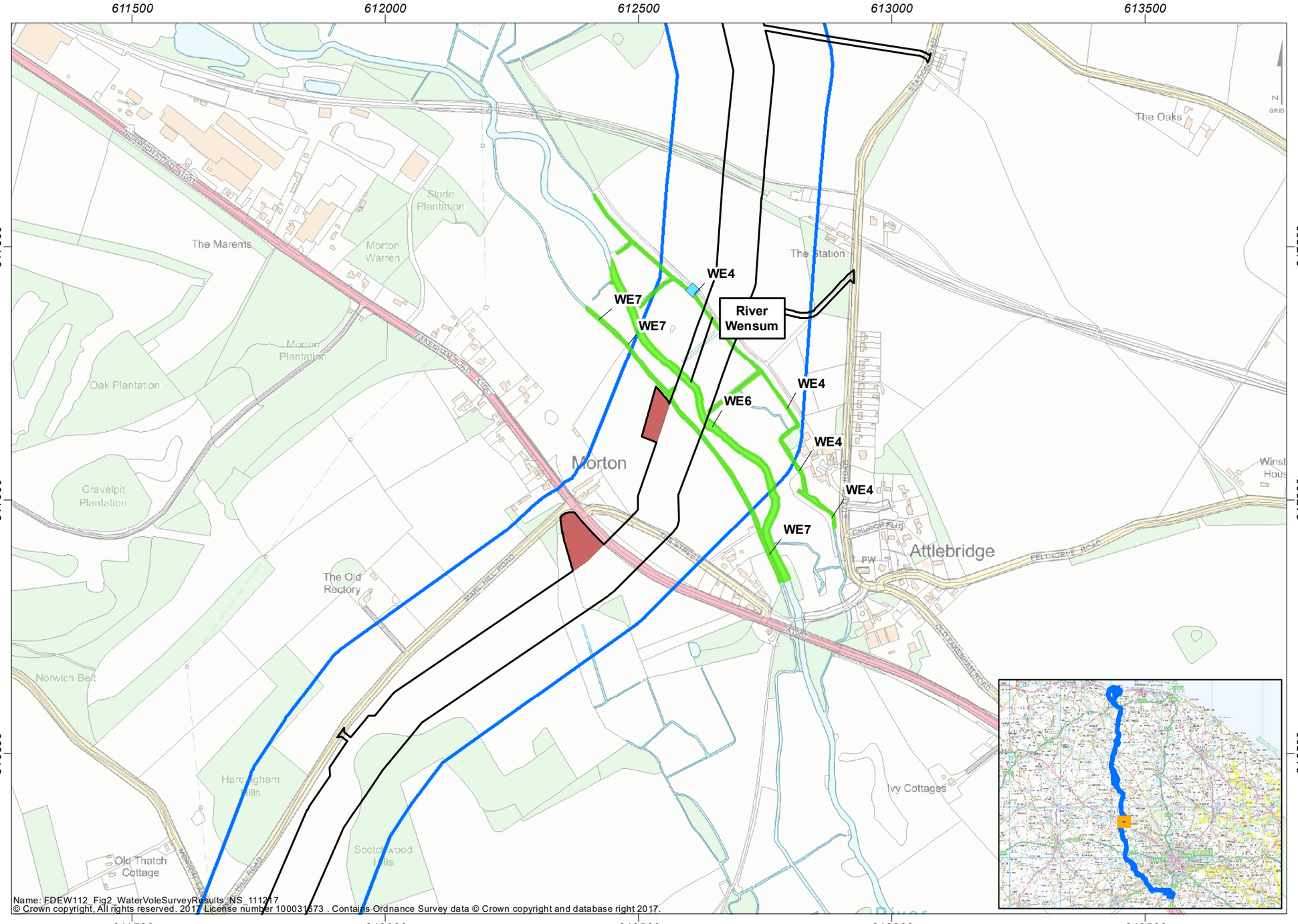
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.9
Water Vole Survey Results.

Doc no: FDEW112/24200/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Sign

- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

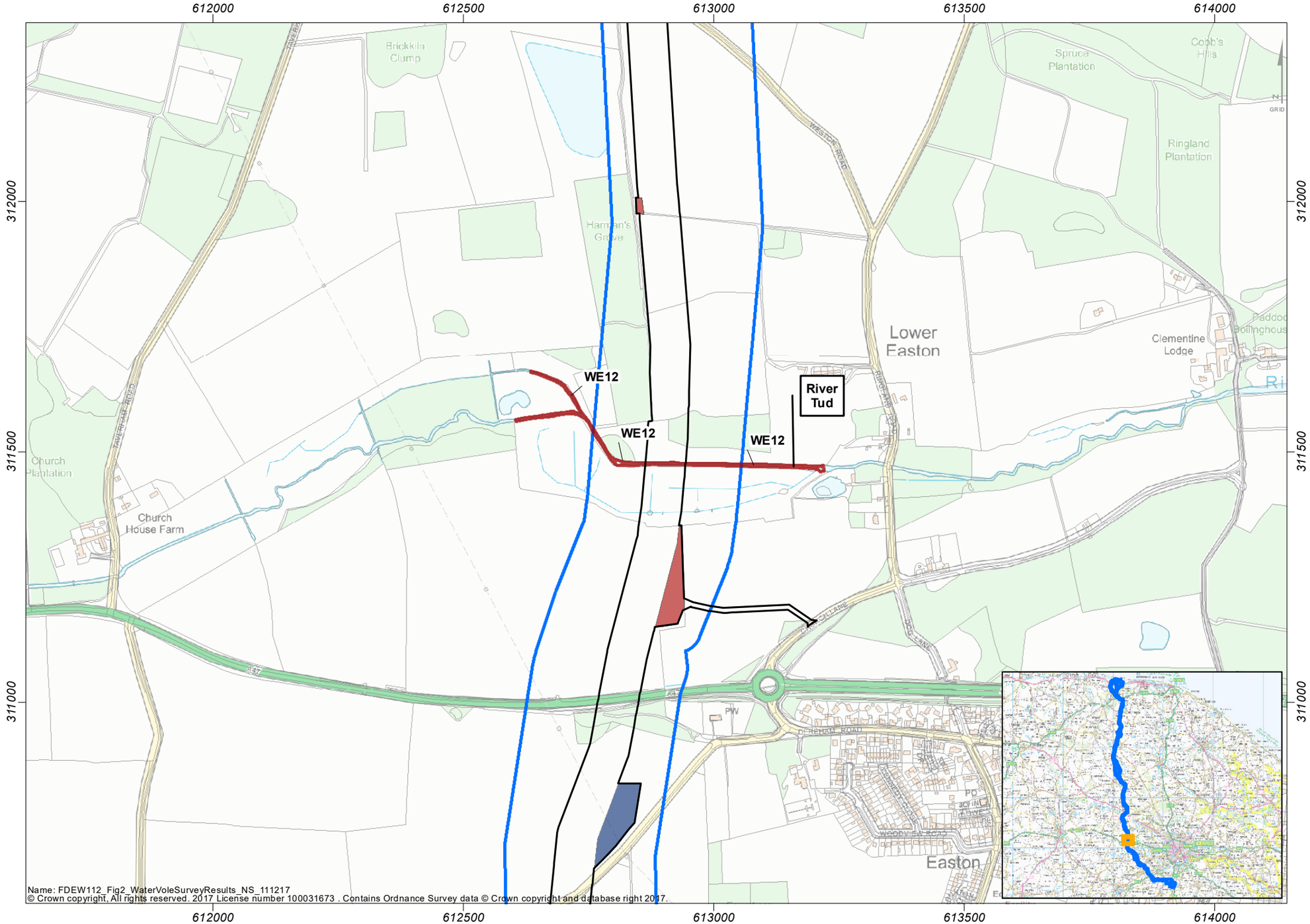
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.10
Water Vole Survey Results.

Doc no: FDEW112/24201/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Waterbody Survey Status

- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Storage Area
- Compound
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

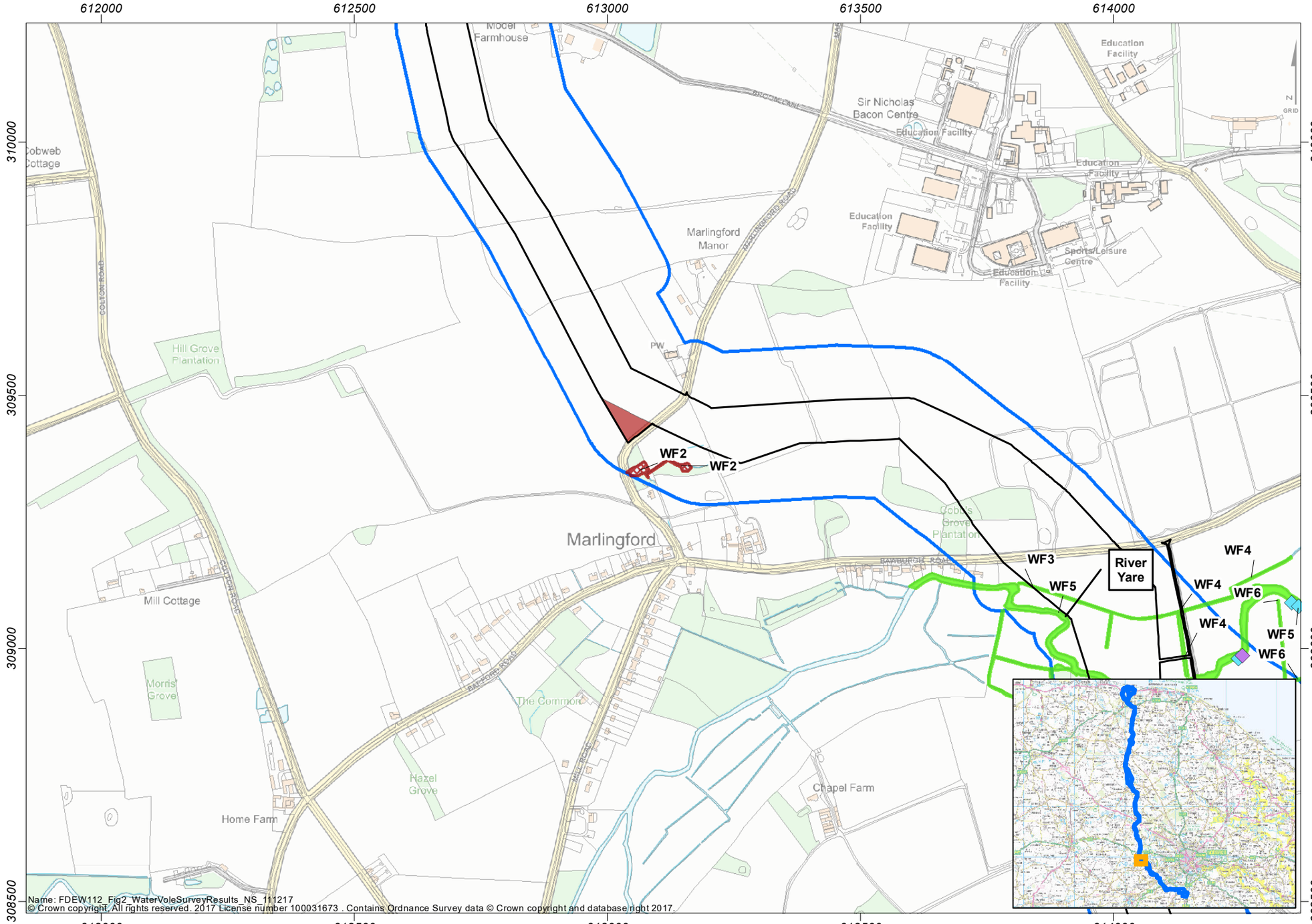
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.11
Water Vole Survey Results.

Doc no: FDEW112/24203/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Sign

- Water Vole Burrow
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

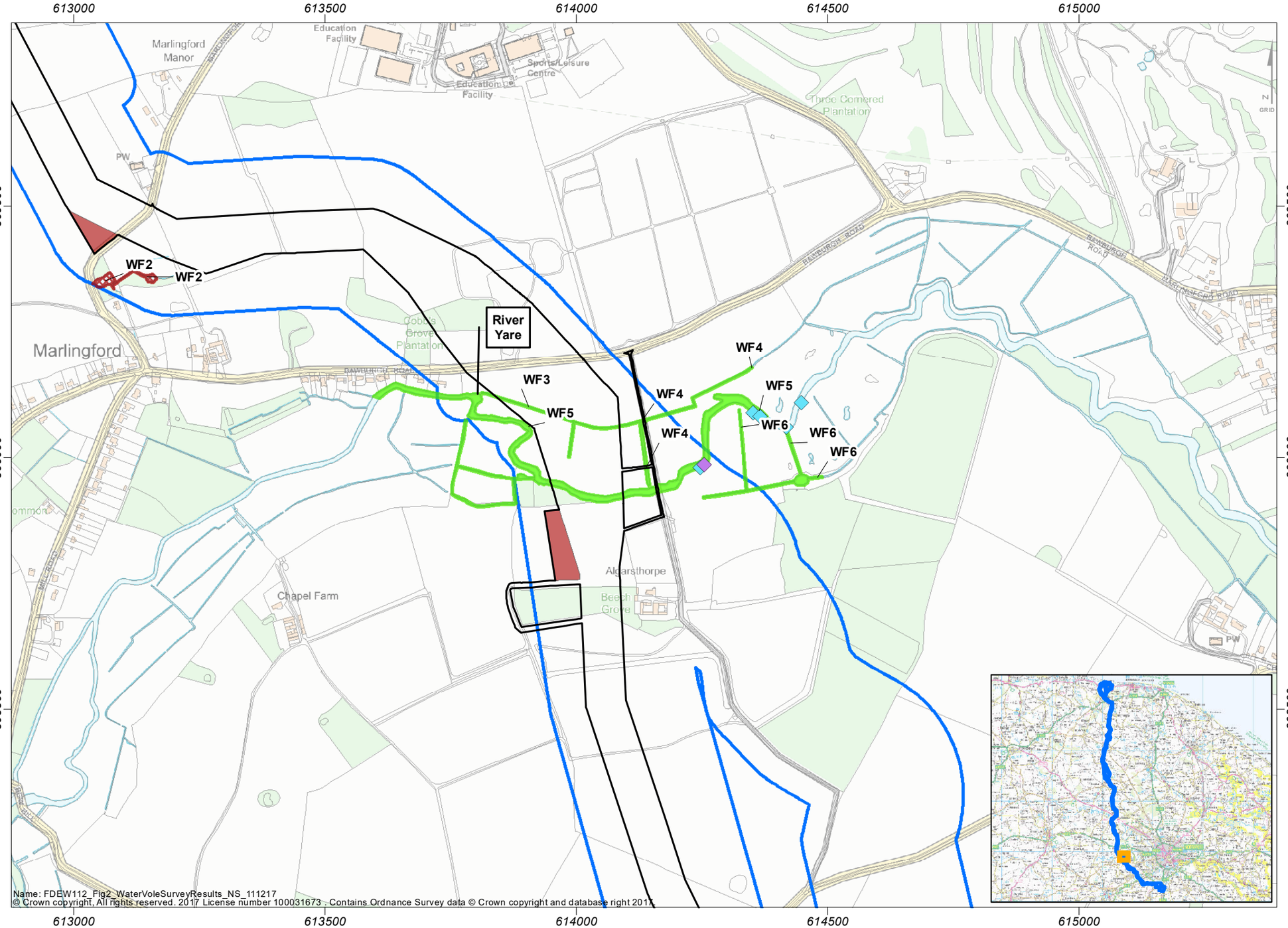
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.12
Water Vole Survey Results.

Doc no: FDEW112/24206/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Sign

- Water Vole Burrow
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

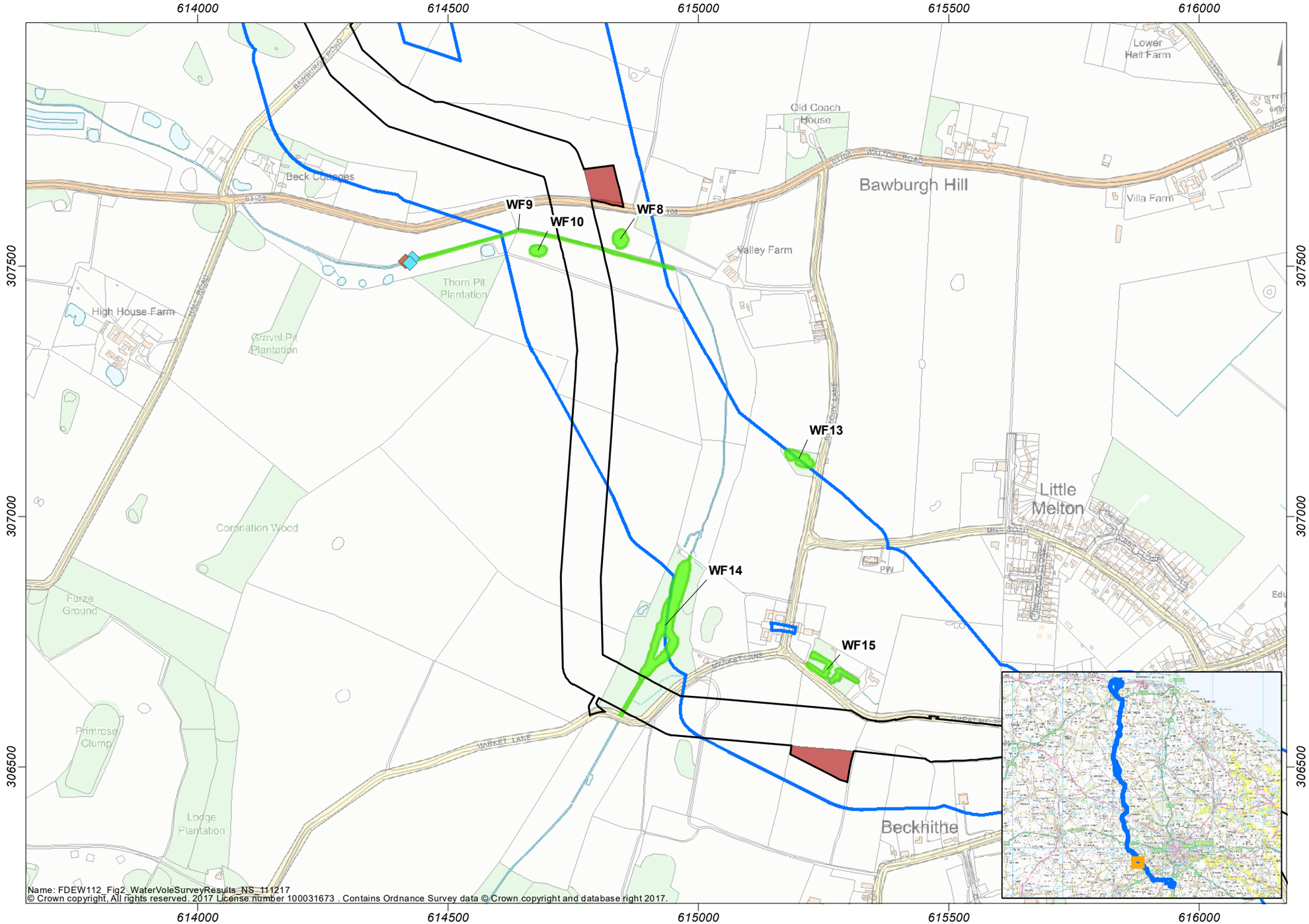
Scale@A3:1:8,970
Vertical reference: Newlyn

0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.13
Water Vole Survey Results.

Doc no: FDEW112/24206/1
Created by: NS
Checked by: AS
Approved by:NS



Name: FDEW112_Fig2_WaterVoleSurveyResults_NS_111217

Water Vole Sign

- Water Vole Feeding Station
- Water Vole Footprint

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

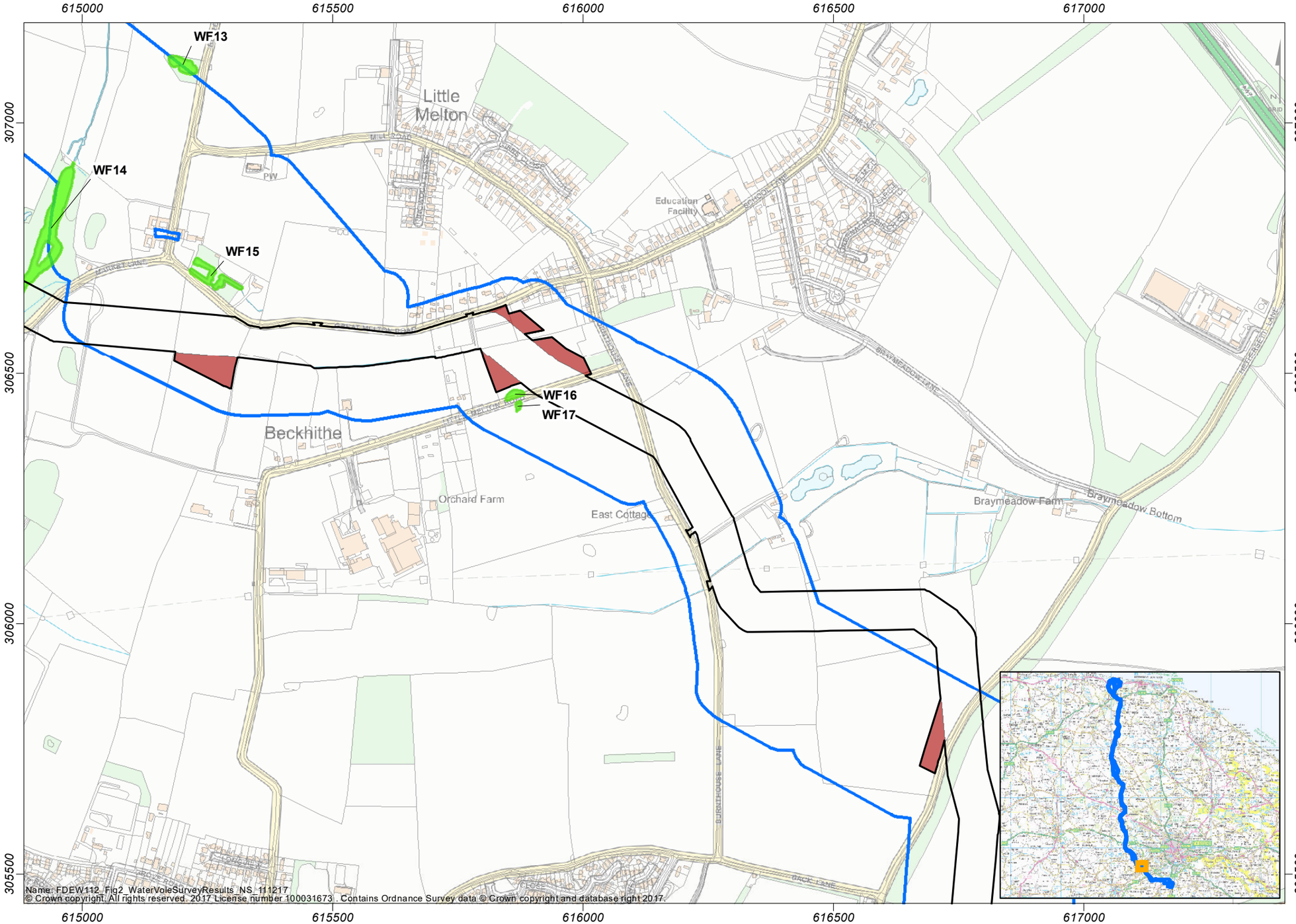
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.14
Water Vole Survey Results.

Doc no: FDEW112/24207/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

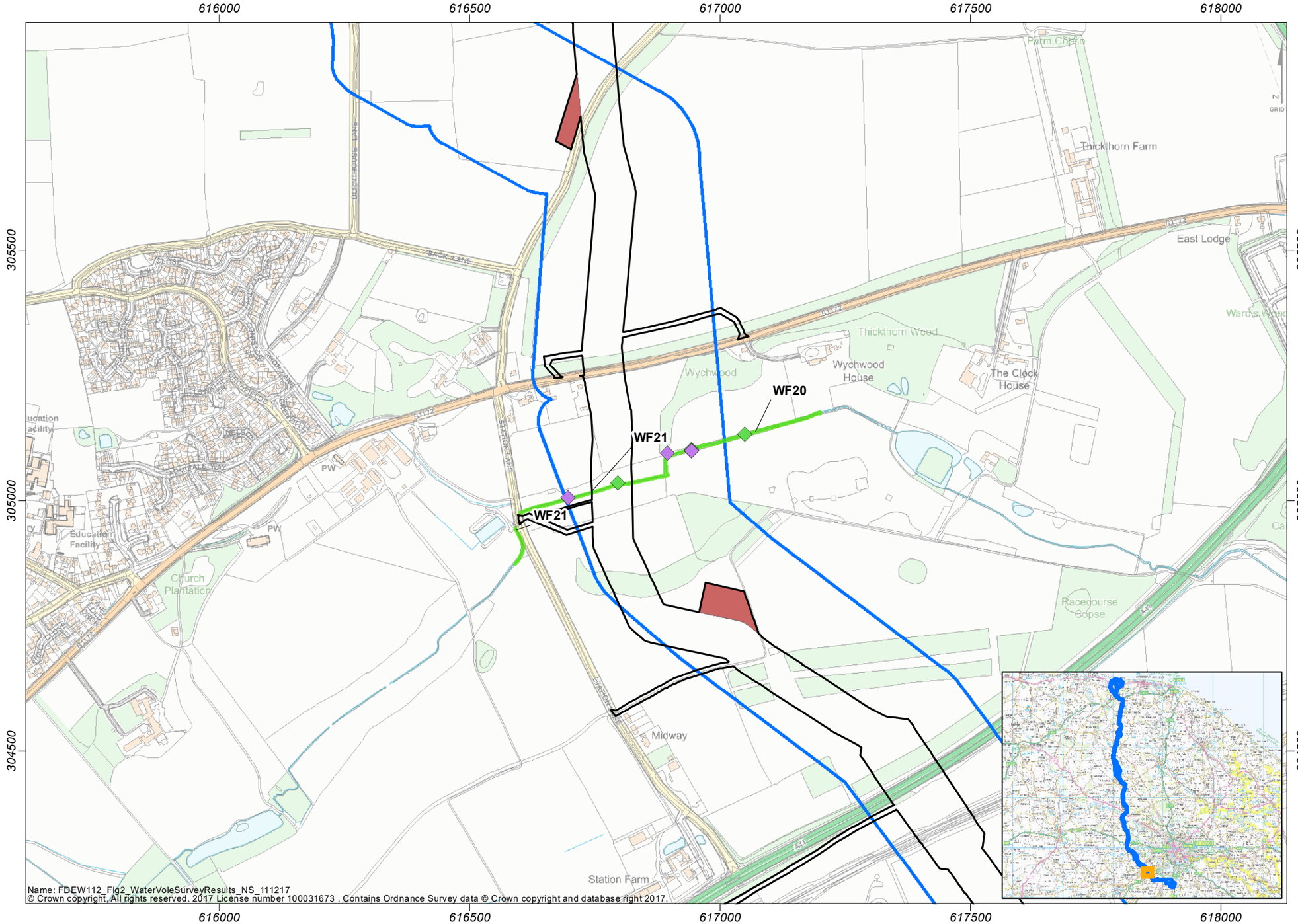
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.15
Water Vole Survey Results.

Doc no: FDEW112/24208/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Name: FDEW112_Fig2_WaterVoleSurveyResults_NS_111217

Water Vole Sign

- Water Vole Burrow
- Water Vole Faeces

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

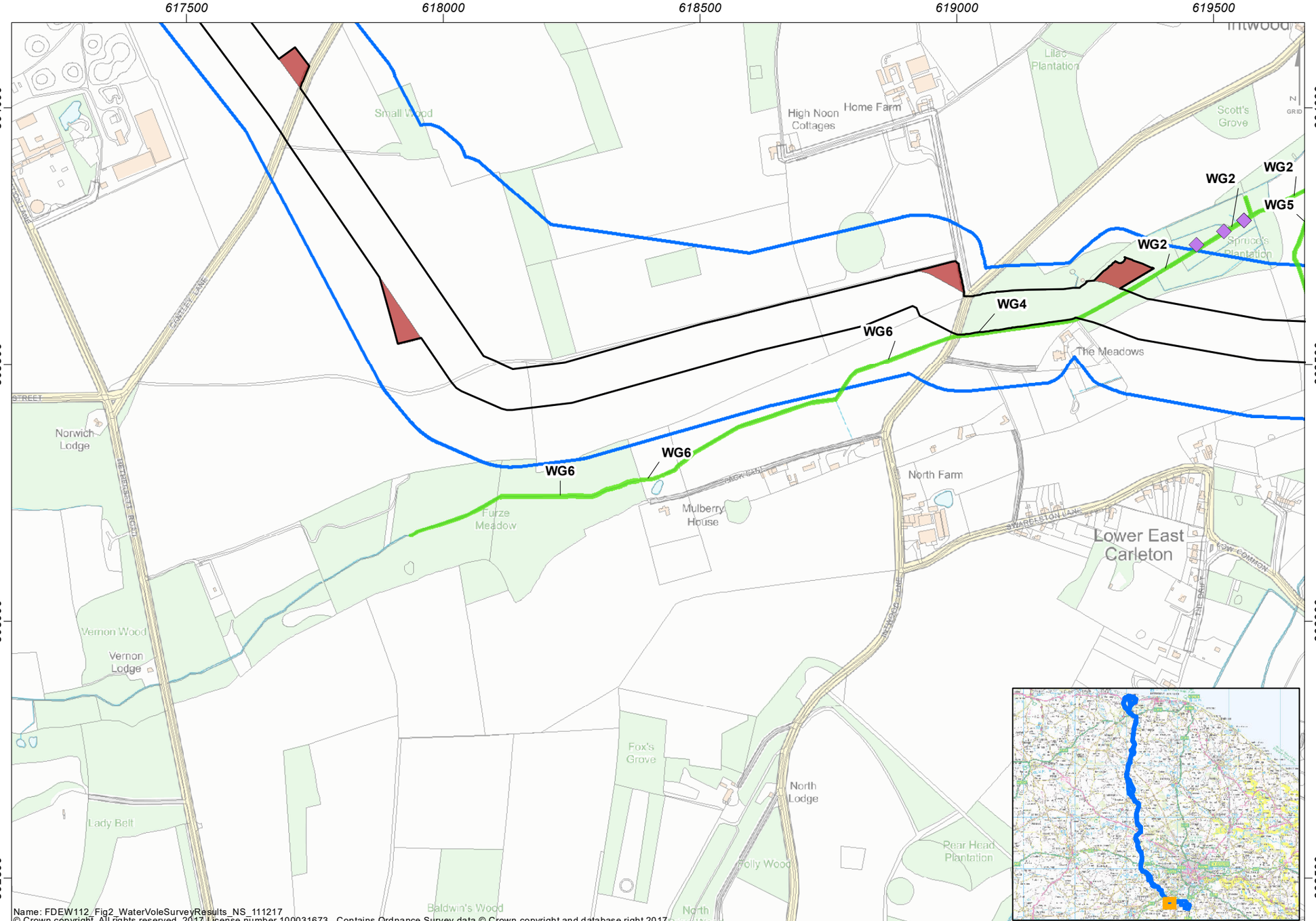
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.16
Water Vole Survey Results.

Doc no: FDEW112/24209/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Sign

- Sighting
- Water Vole Burrow

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

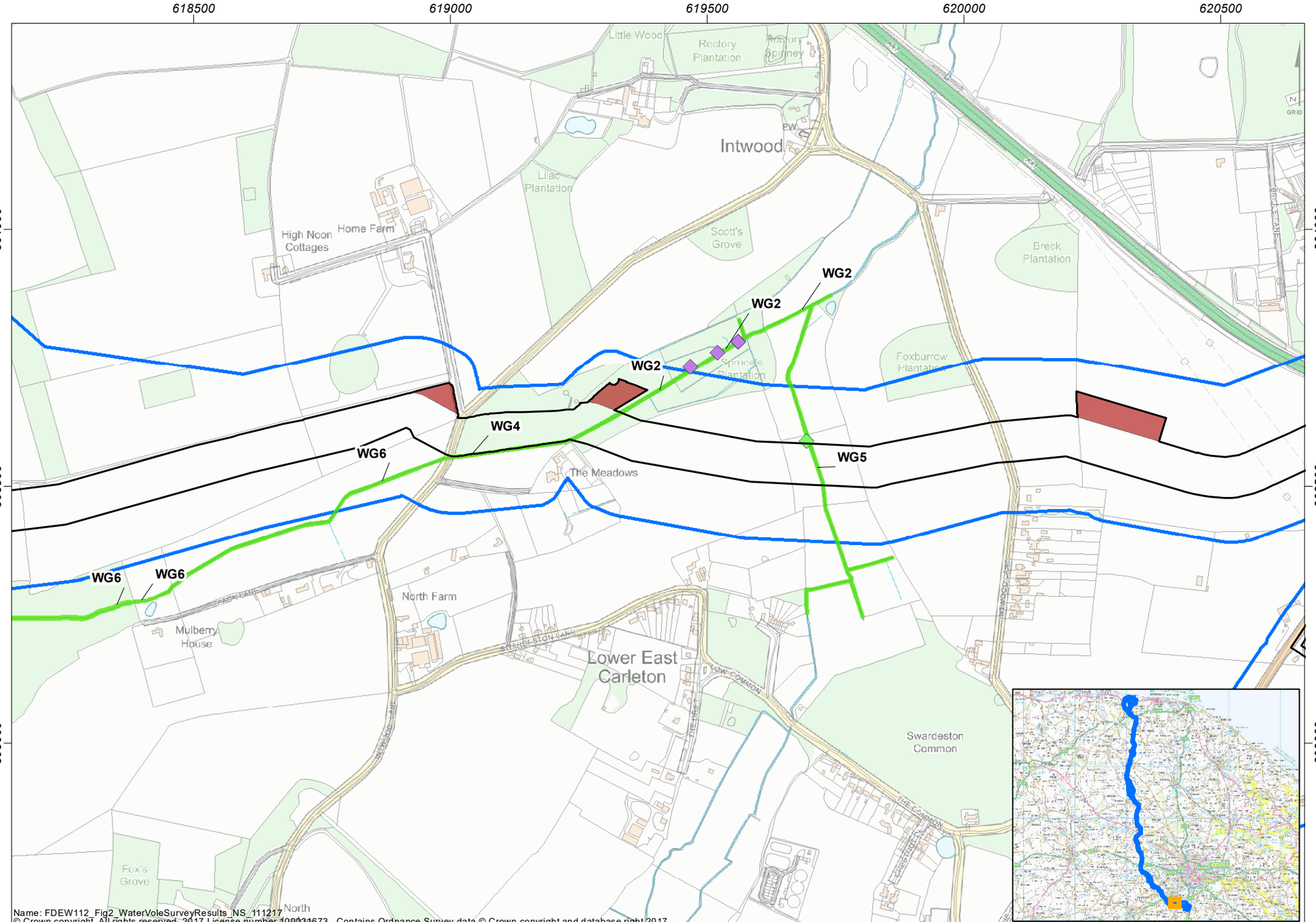
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.17
Water Vole Survey Results.

Doc no: FDEW112/24210/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Sign

- Sighting
- Water Vole Burrow

Water Vole Waterbody Survey Status

- Surveyed
- Water Vole Survey Area
- Storage Area
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

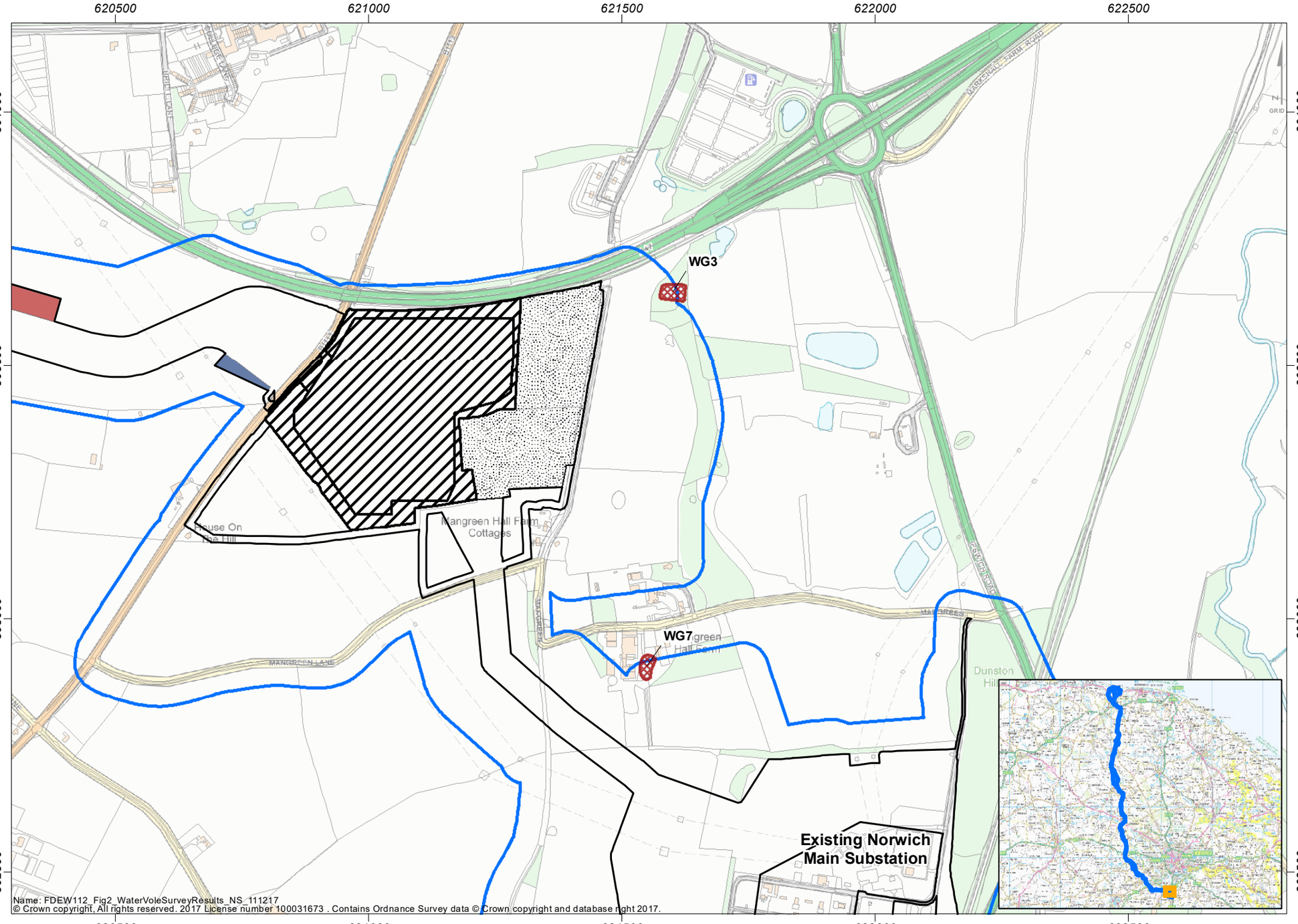
0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.18
Water Vole Survey Results.

Doc no: FDEW112/24211/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted



Water Vole Waterbody Survey Status

- Not Surveyed Due to Access Limitation
- Water Vole Survey Area
- Storage Area
- Compound
- Onshore HVDC converter/HVAC substation - Permanent
- Onshore HVDC converter/HVAC substation - Temporary
- Hornsea Three onshore cable corridor

Note: this set of figures does not include sections of the onshore cable corridor where no features were surveyed.

Reference System : OSGB36
Projection : BNG

Scale@A3:1:8,970
Vertical reference: Newlyn

0 240 Metres

REV	REMARK	DATE
01	Initial Issue	09/11/2017

Hornsea Project Three
Figure: 2.19
Water Vole Survey Results.

Doc no: FDEW112/24213/1
Created by: NS
Checked by: AS
Approved by:NS

RPS Ørsted

A.3 Water vole habitat photographs.

Photograph 1:
WA11.

Photograph 2:
WB5.

Photograph 3:
WC2.

Photograph 4:
WC8.

Photograph 5:
WC9.

Photograph 6:
WC10.

Name: FDEW112_Fig3_WaterVoleSurveyPhotos_DJ_131217

Reference System : N/A
Projection : N/A

Scale@A3: N/A
Vertical reference: N/A

REV	REMARK	DATE
01	Initial Issue	13/12/2017

Hornsea Project Three
Figure 3.1:
Water Vole Habitat Photographs

Doc no: FDEW112/24232/1
Created by: DJ
Checked by: NS
Approved by:NS

RPS Ørsted

Photograph 7:
WC11.

Photograph 8:
WD1.

Photograph 9:
WE4.

Photograph 10:
WF5.

Photograph 11:
WF6.

Photograph 12:
WF9.

Name: FDEW112_Fig3_WaterVoleSurveyPhotos_DJ_131217

Reference System : N/A
Projection : N/A

Scale@A3: N/A
Vertical reference: N/A

REV	REMARK	DATE
01	Initial Issue	13/12/2017

Hornsea Project Three
Figure 3.2:
Water Vole Habitat Photographs

Doc no: FDEW112/24233/1
Created by: DJ
Checked by: NS
Approved by:NS

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Photograph 13:
WF20.

Photograph 14:
WF21.

Photograph 15:
WG2.

Photograph 16:
WG5.

Name: FDEW112_Fig3_WaterVoleSurveyPhotos_DJ_131217

Reference System : N/A
Projection : N/A

Scale@A3: N/A
Vertical reference: N/A

REV	REMARK	DATE
01	Initial Issue	13/12/2017

Hornsea Project Three
Figure 3.3:
Water Vole Habitat Photographs

Doc no: FDEW112/24234/1
Created by: DJ
Checked by: NS
Approved by:NS

RPS Ørsted

Appendix B Waterbody habitat parameters

Table B.1: Waterbody habitat parameters for all waterbodies surveyed.

Waterbody ID	Weather	Waterbody Type	Average Water Width (m)	Average Water Depth (m)	Channel Substrate (if visible)	Flow Velocity	Presence of Visible Pollution	Predominant Bank Profile
WA1	Sunny	Gravel Pit	5-10	0.5-1	Silt	Still	Low	Shallow
WA3	Cloudy	Pond	5-10	<0.5	Earth	Still	None	Shallow
WA4	Cloudy	Reedbed	10-20	<0.5	Earth	Still	None	Steep
WA5	Cloudy	Pond	10-20	<0.5	Silt	Still	None	Shallow
WA6	Patchy Cloud	Runnning Water	2-5	<0.5	Earth	Slow	Low	Flat
WA7	Cloudy	Pond	1-2	<0.5	Earth	Still	Low	Steep
WA8	Cloudy	Pond	10-20	<0.5	Silt	Still	None	Shallow
WA9	Patchy Cloud	Runnning Water	1-2	<0.5	Gravel	Slow	None	Steep
WA11	Cloudy	Reedbed	2-5	0.5-1	Earth	Still	Moderate	Vertical
WB1	Sunny	Ditch	1	<0.5	Silt	Slow	None	Shallow
WB3	Sunny	Runnning Water	5-10	0.5-1	Silt	Moderate	None	Steep
WB4	Cloudy	Pond	10-20	<0.5	Silt	Still	Low	Flat
WB5	Cloudy	Pond	20-40	0.5-1	Silt	Still	Low	Steep
WB12	Sunny	Ditch	1	<0.5	Silt	Slow	None	Flat
WB13	Sunny	Ditch	1	<0.5	Silt	Slow	Low	Steep
WB14	Cloudy	Pond	2-5	<0.5	Silt	Still	None	Shallow
WB15	Cloudy	Pond	5-10	<0.5	Silt	Still	None	Steep
WC1	Sunny	Ditch	1	<0.5	Silt	Slow	None	Steep
WC2	Cloudy	Pond	>40	>2	Gravel	Still	None	Vertical
WC4	Sunny	Pond	20-40	0.5-1	Silt	Still	None	Steep
WC5	Sunny	Pond	10-20	1-2	Earth	Still	Moderate	Steep
WC8	Sunny	Ditch	1-2	<0.5	Silt	Slow	None	Steep
WC9	Sunny	Ditch	1	<0.5	Silt	Slow	Low	Steep
WC10	Sunny	Pond	10-20	1-2	Earth	Still	Low	Steep
WC11	Sunny	Ditch	1-2	0.5-1	Earth	Still	None	Shallow

Waterbody ID	Weather	Waterbody Type	Average Water Width (m)	Average Water Depth (m)	Channel Substrate (if visible)	Flow Velocity	Presence of Visible Pollution	Predominant Bank Profile
WC12	Sunny	Ditch	2-5	<0.5	Silt	Slow	Low	Steep
WD1	Cloudy	Running Water	2-5	0.5-1	Silt	Moderate	Low	Vertical
WE1	Cloudy	Running Water	2-5	<0.5	Gravel	Moderate	None	Vertical
WE2	Patchy Cloud	Ditch	2-5	0.5-1	Silt	Moderate	Low	Steep
WE4	Sunny	Ditch	2-5	<0.5	Silt	Slow	None	Vertical
WE7	Sunny	Ditch	2-5	<0.5	Silt	Still	None	Steep
WF5	Cloudy	Running Water	5-10	>2	Gravel	Moderate	None	Vertical
WF6	Cloudy	Ditch	1-2	<0.5	Silt	Still	None	Shallow
WF8	Patchy Cloud	Pond	20-40	1-2	Earth	Still	Low	Shallow
WF10	Cloudy	Pond	20-40	1-2	Earth	Still	None	Shallow
WF13	Patchy Cloud	Pond	20-40	<0.5	Earth	Still	Moderate	Steep
WF15	Patchy Cloud	Pond	2-5	<0.5	Earth	Still	Low	Shallow
WF16	Sunny	Pond	10-20	1-2	Earth	Still	Moderate	Steep
WF17	Sunny	Pond	10-20	0.5-1	Earth	Still	Moderate	Steep
WF20	Cloudy	Running Water	1-2	0.5-1	Silt	Slow	Low	Shallow
WF21	Light Rain	Running Water	1	<0.5	Other	Moderate	Low	Shallow
WF23	Patchy Cloud	Running Water	1	<0.5	Silt	Moderate	None	Shallow
WG2	Patchy Cloud	Running Water	1	<0.5	Earth	Moderate	Low	Steep
WG4	Patchy Cloud	Running Water	1	<0.5	Earth	Moderate	Low	Steep
WG5	Cloudy	Running Water	1	<0.5	Other	Moderate	Low	Shallow
WG6	Sunny	Running Water	1	<0.5	Silt	Moderate	Low	Shallow
WG22	Sunny	Ditch	1	<0.5	Earth	Still	Low	Steep
WG23	Patchy Cloud	Ditch	1	<0.5	Earth	Still	Low	Shallow