



**Hertfordshire Minerals Local Plan  
Review**

**Updated Addendum to the Level 1  
Strategic Flood Risk Assessment  
(SFRA)**

**Sequential Test of Mineral Sites in the  
Proposed Submission Minerals Local  
Plan (2019)**

**December 2018**

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## **1.0 Introduction**

- 1.1 Hertfordshire County Council, as Mineral Planning Authority (MPA) for Hertfordshire, is in the latter stages of reviewing the Hertfordshire Minerals Local Plan (MLP). The final output of the review will be a new MLP which will replace the existing Plan adopted in 2007. The emerging MLP will allocate sites and areas for sand and gravel extraction that have been identified to provide a steady and adequate supply of aggregate during the 15-year Plan period .
- 1.2 As part of the review process, the council is publishing a Regulation 19 Proposed Submission Minerals Local Plan (PSMLP). The PSMLP is the minerals planning document that the council intends to submit to the Secretary of State to determine whether it can be adopted and become part of the Development Plan for Hertfordshire. The PSMLP was produced following a consultation on a Regulation 18. Draft MLP (2017).
- 1.3 When allocating land for development in a Local Plan, a local authority should apply the 'sequential test' to demonstrate that development is allocated outside of high and medium flood risk areas. At the outset of the review, the county council produced a Level 1 Strategic Flood Risk Assessment (SFRA) (2015) which compiled various sources of information and data related to flood risk in Hertfordshire. The Level 1 SFRA was produced in order to be used to undertake the 'sequential test' to assess the potential flood risk of sites and/or areas being considered for inclusion in the emerging MLP.
- 1.4 An addendum to the SFRA was produced in 2017 which contained details of a series of sequential tests assessing the potential flood risk of sites being considered for inclusion in the Draft MLP. It concluded that the three Specific Sites and one Preferred Area contained in the Draft MLP were appropriate for allocation.
- 1.5 Prior to the publication of the PSMLP, the Level 1 SFRA was updated (2018) to include data sets and publications that had been updated since the original Level 1 SFRA (2015) was published. This has necessitated the original SFRA Addendum (2017) being updated to ensure that the sequential tests of potential mineral sites use the most up to date data.
- 1.6 This document is the updated Addendum to the SFRA. It contains details of the application of the sequential test in the preparation of the PSMLP.

## 2.0 Assessment of Flood Risk

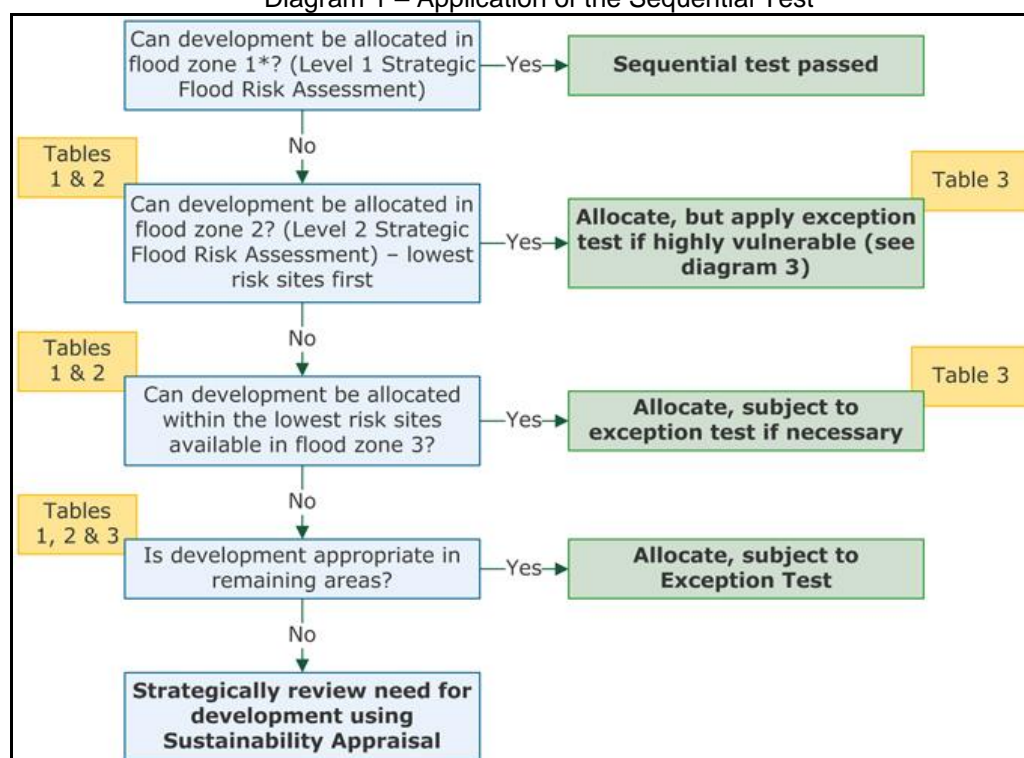
### Strategic Flood Risk Assessment

- 2.1 A SFRA is a study which assesses the risk to an area from flooding from all sources, now and in the future, and assesses the impact that land use changes and development in an area will have on flood risk.
- 2.2 Data related to flood risk is updated regularly and this SFRA Addendum should be considered a 'live' document. This document is an updated version of the SFRA Addendum (2017). It has been produced specifically to support the PSMLP.

### Sequential Test

- 2.3 The sequential test is applied to steer development to areas with the lowest probability of flooding.
- 2.4 Diagram 2 in Section 6 of the Flood Risk and Coastal Change chapter in the NPPG, outlines how local planning authorities should apply the sequential test when identifying potential sites through the local plan process. This is replicated in Diagram 1.

Diagram 1 – Application of the Sequential Test



\* Other sources of flooding also need to be considered.

- 2.5 Whilst the guidance focuses on the acceptability of allocating sites based on Flood Zones (which are a representation of risk of flooding from fluvial

sources), the sequential test should take account of other sources of flooding. Potential sources of flooding and the evidence to use for assessment of the risks are identified in the updated Level 1 SFRA (2018).

- 2.6 If it is not possible for development to be located in zones with the lowest probability of flooding, a local authority must demonstrate that the development provides wider sustainability benefits that outweigh the identified flood risk. In addition, a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime without increasing flood risk. This is called an 'exception test' which is only undertaken if a sequential test identifies the need to do so.

### **The Proposed Submission Minerals Local Plan**

- 2.7 The PSMLP is the version of the MLP that the council intends to submit to the Secretary of State. It contains a vision, objectives and a collection of policies which will be used to guide future mineral development in the county. The PSMLP also contains three Specific Sites and one Preferred Area which are identified as locations for future minerals development:

- Specific Site 1 – Hatfield Aerodrome
- Specific Site 2 – Hatfield Quarry - Furze Field
- Specific Site 3 – Hatfield Quarry - Land adjoining Coopers Green Lane
- Preferred Area 1 – Briggens Estate (Olives Farm)

- 2.8 The Specific Sites and Preferred Area were selected based on the findings of a Site Selection Report produced by Land Use Consultants (LUC)<sup>2</sup>. The second version of the report (August 2018) was published in support of the Regulation 19 PSMLP (2018). It contains sites submitted to the council during a Call for Sites exercise (2016); unworked sites which are allocated in the adopted Minerals Local Plan (2007); and sites submitted to the council during the consultation on the Draft MLP. The findings of the individual site assessments in the Site Selection Report helped to guide an assessment of potential grouped 'site options' for inclusion in the emerging Plan.

- 2.9 The Sequential testing has been applied to all sites included in the August 2018 version of the Site Selection Report.

- 2.10 A summary of the sequential test findings is shown in Table 2, Chapter 5 of this document. A map showing the location of all the sites is included in Appendix 1. Individual site maps used for the sequential test of each site are included in Appendix 2.

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<sup>2</sup> <https://www.hertfordshire.gov.uk/services/recycling-waste-and-environment/planning-in-hertfordshire/minerals-and-waste-planning/minerals-planning/minerals-local-plan-review/minerals-local-plan-review.aspx>

### **3.0 Sources of Flooding in Hertfordshire**

#### **Overview of findings from the Level 1 SFRA (2015)**

- 3.1 A brief overview of the findings of the Updated Level 1 SFRA (2018) is given below. Hertfordshire is affected by six sources of flooding. The SFRA compiled data for each source of flooding and this data forms the basis of the sequential test in the Chapter 5.

#### Surface Water Flooding

- 3.2 Surface water flooding is caused by natural overland flow and the introduction of impermeable built-up areas during periods of sustained or heavy rainfall. This can cause ponding of where water is obstructed or collects in low lying areas. The risk of surface water flooding will potentially increase as the extent of built-up areas and impermeable hard surfacing increases across the county without suitable mitigation.
- 3.3 Map 8 of the Updated Level 1 SFRA (2018) shows the extent of areas within the county that are at risk of surface water flooding (1 in 100 year event). Whilst areas can be likely to be affected by surface water flooding, this should not, in itself, be used to discount future development.

#### Groundwater Flooding

- 3.4 Groundwater flooding occurs when water held underground rises to a level where it breaks the surface in areas away from usual channels and drainage pathways. It occurs generally a result of exceptional extended periods of heavy rain, but can also occur as a result of reduced abstraction, underground leaks or the displacement of underground flows. Once groundwater flooding has occurred, the water can be in situ for a lengthy period of time.
- 3.5 The presence of the chalk aquifer in Hertfordshire and other underground water bearing areas such as the river gravel deposits mean that there is potential for groundwater flooding in Hertfordshire.
- 3.6 Map 6 of the Updated Level 1 SFRA (2018) shows the areas of the county that are situated within groundwater source protection zones 2 and 3 and Map 7 shows areas susceptible to groundwater flooding. These are based on 1km squares where the percentage of the area has the potential for groundwater emergence above 25%. The majority of Hertfordshire is not shown to be at risk above this level, with very few km squares with a percentage greater than 50%.

### Fluvial Flooding

- 3.7 Fluvial flooding occurs when the capacity of a watercourse is reached, causing water to spill out of the channel onto adjoining areas, known as the floodplain. Significant levels of fluvial flood risk are seen in the south and south eastern parts of the county in particular.
- 3.8 Map 2 of the Updated Level 1 SFRA (2015) shows the extent of areas situated within flood zones 2 and 3 within the county. It should be noted that fluvial flooding is associated with all watercourses and not just from 'main rivers'. Not all watercourses have the benefit of modelling and therefore may not have an associated flood zone.

### Sewer or Highway Flooding

- 3.9 Sewer or highway flooding is caused when a blockage occurs or by excess surface water entering the drainage network, exceeding available capacity. This generally occurs during periods of heavy rainfall when the drainage network becomes overwhelmed.
- 3.10 As records of sewer flooding are only referenced to broad areas by postcode district, it is not possible to provide a spatial representation of the associated risk.

### Canal Flooding and Reservoir Flooding

- 3.11 Canal flooding is caused by overtopping or breach of the canal network. There are a number of canals within Hertfordshire including the Grand Union Canal, the Lee Navigation and the Stort Navigation.
- 3.12 The Canal and Rivers Trust (formerly British Waterways) is currently investigating the potential for flooding from the canal network. Current records indicate only two minor breach events on record within Hertfordshire on the Grand Union Canal and it is considered that there are no significant flood risks associated expressly with the canals in Hertfordshire.
- 3.13 Reservoir flooding occurs when a reservoir structure is overtopped or fails due to damage or collapse of the reservoir structure.
- 3.14 Map 5 of the Updated Level 1 SFRA (2018) compiles the largest areas that might be flooded if a reservoir that holds over 10,000 cubic metres of water were to fail; lakes and other inland waters.

### **Climate Change**

- 3.15 As well as looking at flood risk using past events, the future risk of flooding needs to be assessed. This is especially relevant because of the need to consider the potentially significant effects arising from climate change.

Changes in climatic conditions can affect local flood risk in several ways. However, impacts will depend on local conditions and vulnerability.

3.16 The Environment Agency updated climate change allowances in February 2016. Allowances are based on projections and different scenarios of CO<sub>2</sub> emissions to the atmosphere and the resultant anticipated changes to:

- Peak river flow by river basin district
- Peak rainfall intensity
- Sea level rise
- Offshore wind speed and extreme wave height

3.17 For the sites being considered for inclusion in the emerging MLP, climate change allowances were not required as part of the sequential tests. This was because the sites are identified as being at low risk from fluvial flooding as they are 99-100% within Flood Zone 1. Sites that contain larger sections within Flood Zone 2 do not require climate change allowances either because mineral extraction is considered 'water compatible'<sup>3</sup>.

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<sup>3</sup> <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

## **4.0 The Sequential Test**

### **Flood Zones and the Sequential Test**

- 4.1 Whilst all sources of flooding should be taken account of, the basis for the Sequential Test is the Environment Agency's flood zone categorisation, resulting in all land in England being identified as falling within one of the following classifications, which are described below. Definitions have been taken from table 1 in section 4 of the Flood Risk and Coastal Change section of the NPPG.

#### Flood Zone 1 (Lower Probability of Flooding)

- 4.2 Land within this flood zone is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding. The Sequential Test identifies any land use as appropriate within this location. Areas located within flood zone 1 are shown as 'clear' on the Environment Agency flood map and is classed as all land outside of flood zones 2 and 3.

#### Flood Zone 2 (Medium Probability of Flooding)

- 4.3 Land within this flood zone has been assessed as having a medium probability of experiencing flooding from rivers and the sea (i.e. having between a 1 in 100 and 1 in 1000 annual probability of river flooding, or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. Land within this flood zone is shown in light blue on the Environment Agency's flood map.

#### Flood Zone 3a (High Probability of Flooding)

- 4.4 Land within this zone has been assessed as having a high probability of experiencing flooding from rivers and the sea (i.e. between 1 in 100 or greater annual probability of river flooding; or between a 1 in 200 or greater annual probability of sea flooding. Land within this flood zone is shown in dark blue on the Environment Agency's flood map.

#### Flood Zone 3b (The Functional Floodplain)

- 4.5 Land within this zone is normally classed as having an annual probability of 1 in 20 (5%) or greater in any year of flooding or land that is designed to flood in an extreme flood (0.1%). The primary purpose of the functional flood plain is where water has to flow or be stored in times of flood. The NPPG requires local planning authorities to identify within their SFRAs areas of the functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. Land within this zone is not separately distinguished from flood zone 3 on the Environment Agency's flood map.
- 4.6 Development within flood zones 2, 3a and 3b should seek opportunities to reduce the overall level of flood risk in the area through the layout and

form of the development and the appropriate application of sustainable drainage systems.

### Sequential Test Vulnerability Classes

- 4.7 In order to apply the sequential test, local planning authorities are required to take into account the flood risk vulnerability of land uses. Table 2 in section 4 of the Flood Risk and Coastal Change section of the NPPG categorises different types of uses and development according to their vulnerability to flood risk.
- 4.8 There are a total of five vulnerability classes which are listed below:
- Essential Infrastructure;
  - Highly Vulnerable;
  - More Vulnerable;
  - Less Vulnerable;
  - Water Compatible-Development.
- 4.9 Of relevance to the review of the Hertfordshire Minerals Local Plan, all types of mineral workings (except for sand and gravel) have been classified as 'less vulnerable'. Sand and gravel workings are however classified as 'water-compatible development.' This is summarised in Table 1.

Table 1 Flood Risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability classification	Less Vulnerable	Water-Compatible	Appropriate for Minerals Development?
Flood Zone 1	✓	✓	All minerals workings and processing facilities are acceptable in flood zone 1.
Flood Zone 2	✓	✓	All minerals workings and processing facilities are acceptable in flood zone 2.
Flood Zone 3a	✓	✓	All minerals workings and processing facilities are acceptable in flood zone 3a.
Flood Zone 3b	X	✓*	Only sand and gravel workings are acceptable. Other minerals workings and processing facilities are not acceptable in flood zone 3b.

Key:

- ✓ Development is appropriate
- X Development should not be permitted

- 4.10 Following the application of the Sequential Test, it could be that only limited areas within a potential sand and gravel site are suitable within



flood zones 2, 3 and 3b. This may not affect the actual extraction of sand and gravel, but could be appropriate to ensure that the plant site and associated processing facilities are located within the areas of a site that are covered by flood zone 1.

- 4.11 If a mineral extraction site were to be located within flood zones 2 and 3, or partly outside of flood zone 1, the NPPG<sup>4</sup> encourages minerals planning authorities to take into account at the restoration stage the potential to, amongst other things, increase flood water storage, which can also enhance the natural environment.

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<sup>4</sup> NPPG Paragraph: 008 Reference ID: 7-008-20140306.

## **5.0 Findings of the MLP Sequential Test**

### **Summary of Sequential Test**

- 5.1 Table 2 summarises the flood risk information for each site and the conclusion from the sequential test process. Sand and gravel extraction sites are classed as 'water compatible' but the allocation of sites should follow the sequential approach and consider the impact of flooding from sources other than fluvial flooding.
- 5.2 It can be seen that the sites within the PSMLP are considered appropriate for sand and gravel extraction and working. The majority of all sites considered for inclusion in the emerging MLP are also considered appropriate for sand and gravel extraction and processing. Only two sites would require further assessment to be deemed appropriate but seeing as sand and gravel extraction is classed as 'water compatible', it is possible that they could also be considered appropriate.

### **Site Specific Flood Risk Assessment Guidance**

- 5.3 Due to the size and scale of the proposed mineral workings, any new planning application for sand & gravel within the county will likely need to be accompanied by an individual Flood Risk Assessment (FRA), regardless of their location within flood zones 1, 2 and 3 and the outcome of the sequential tests. FRAs should assess whether the development will be acceptable in flood risk terms both within the site and on the surrounding area.

Table 2 – Findings of Sequential Tests

Site	Main Rivers	Flood Zone	Historic Flooding	Flood Warning Areas	Bodies of Water	Groundwater Source Protection Zones	Susceptibility to Groundwater Flooding	Risk of Surface Water Flooding	Outcome of Sequential Test
<b>Specific Site 1: Hatfield Aerodrome</b>	River Nast crosses the site through a culvert	Low Risk (>99% FZ1)	Low Risk (<1% of site)	Low Risk (0%)	Low Risk	>50% Zone III, <50% Zone II	Low Risk (0% of site at risk)	Low Risk (<10% of site at low risk)	Development is appropriate
<b>Specific Site 2: Hatfield – Furze Field</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Low Risk (0% of site at risk)	Low Risk (<10% of site at low risk)	Development appropriate
<b>Specific Site 3: Hatfield – Land adjoining Coopers Green Lane</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Low Risk (<50% of site at 0-25% risk)	Medium Risk (10% of site at medium risk)	Development is appropriate
<b>Preferred Area 1: The Briggens Estate</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>75% Zone III, <25% unprotected	Low Risk (>75% of site at <25% risk, <25% of site at 25-50% risk)	Low Risk (<5% of site at high risk)	Development is appropriate
<b>MLPCS001 RS Land at Cromer Hyde Farm</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>75% Zone III, <25% unprotected	Low Risk (<25% of site at 0-25% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS002 Salisbury Hall</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% unprotected	Low Risk (0% of site at risk)	Low Risk (<5% of site at low risk)	Development is appropriate

<b>MLPCS003 Land at Ware Park</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	50% Zone II, 50% Zone III	Medium Risk (>50% of site at 25-50% risk, <50% of site at 0- 25% risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS004 Land at Pynsefield</b>	River Colne runs within 150 m of the northern site boundary	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone II	High Risk (100% of site at 75-100% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS005 Nashes and Fairfolds</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Low Risk (0% of site at risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS007 Barwick</b>	River Rib crosses the site	Medium Risk (<15% FZ3, <10% FZ2, >75% FZ1)	Medium Risk (17% of site)	Medium Risk (18% of site)	Low Risk	100% Zone II	Medium Risk (50% of site at 25-50% risk, 50% of site at 0- 25% risk)	Low Risk (<10% of site at low risk)	Development could be appropriate following modelling of the site incorporating climate change allowances.
<b>MLPCS011 Waterhall Farm Fields</b>	River Lee (Upper) runs along the northern site boundary	Medium Risk (39% FZ3, 48% FZ2, <15% FZ2)	High Risk (86% of site)	High Risk (88% of site)	Low Risk	>75% Zone III, <25% unprotected	Medium Risk (>75% of site at 50-75% risk, <25% of site at 0- 25% risk)	Low Risk (<50% of site at low risk)	Development could be appropriate following modelling of the site incorporating climate change allowances.

<b>MLPCS012 Waterhall Broad Green</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Medium Risk (50% of site at 50-75% risk, <50% of site at 0- 25% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS013 Harry's Field</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone II	Low Risk, (<25% of site at 0-25% risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS014 Waterhall Bunkers Hill South</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>75% unprotected, <25% Zone III	Low Risk (100% of site at 0-25% risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS015 Plashes Farm</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone II	Low Risk (>75% of site at 0-25% risk, <25% of site at no risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS016 Waterhall Howe Green</b>	River Lee (Upper) runs within 150 m of the northern site boundary	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>95% Zone III, <5% Zone II	Medium Risk (>75% of site at 50-75% risk, <25% of site at 0- 25% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS017 Robins Nest Hill</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Medium Risk (100% of site at 50-75% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>MLPCS018 Southfield Wood East</b>	River Lee (Upper) runs within 100 m of the southern site boundary	Low Risk (>99% FZ1)	Low risk (<1%)	Low Risk (0%)	Low Risk	100% Zone III	Low Risk (<25% of site at 0-25% risk, >75% of site at 50-75% risk)	Low Risk (0% of site at risk)	Development is appropriate

<b>MLPCS019 Pipers End</b>	River Lee (Upper) runs within 100 m of the southern site boundary	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>75% Zone III, <25% unprotected	Low Risk (>50% of site at 0-25% risk, >25% of site at 25-50% risk, <25% at 50-75% risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS020 Roundhill Wood</b>	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	100% Zone III	Low Risk (0% of site at risk)	Low Risk (0% of site at risk)	Development is appropriate
<b>MLPCS021 North Mymms (West)</b>	River Colne runs adjacent to eastern site boundary	Low Risk (<15% FZ3, <5% FZ2)	Medium Risk (8% of site)	Medium Risk (10% of site)	Low Risk	100% Zone III	Low Risk (>50% of site at 0-25% risk, <50% of site at no risk)	Medium Risk (<25% of site at medium risk)	Development is appropriate
<b>MLPCS022 (North Mymms East)</b>	River Colne cuts across site	Low Risk (<10% FZ3, <5% FZ2)	Low Risk (<5% of site)	Medium Risk (16% of site)	Low Risk	100% Zone III	Low Risk (>50% of site at 0-25% risk, <50% of site at no risk)	Medium Risk (<25% of site at medium risk)	Development is appropriate
<b>MLPCS023 Warren Farm</b>	River Colne runs within 200 m of the northern site boundary		Low Risk (<1% of site)	Low Risk (<1%)	Low Risk	50% Zone III, 50% Zone II	Low Risk (>50% of site at no risk, >25% of site at 50-75% risk, <25% of site at 0-25% risk)	Low Risk (<5% of site at low risk)	Development is appropriate
<b>Adopted PA1 Former BAe Site</b>	River Nast crosses the site through a culvert	Low Risk (100% FZ1)	Low Risk (<1% of site)	Low Risk (0%)	Low Risk	>50% Zone III, <50% unprotected	Low Risk (0% of site at risk)	Low Risk (<5% of site at low risk)	Development is appropriate

Adopted PA2 Land adjoining Rickneys Quarry	Low Risk	Low Risk (100% FZ1)	Low Risk (0% of site)	Low Risk (0%)	Low Risk	>50% Zone II, >25% Zone III, <25% unprotected	Low Risk (<50% of site at no risk, <50% of site at 0- 25% at risk, <25% of site at 25-50% risk)	Low Risk (0% of site at risk)	Development is appropriate
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## **6.0 Conclusion**

### **Findings of the Sequential Test**

- 6.1 This Updated SFRA Addendum has assessed all the sites considered for inclusion in the emerging MLP.
- 6.2 All sites were subjected to the sequential test which shows there to be a sufficient selection of sites/areas that are suitable for mineral working to provide a steady and adequate supply of minerals throughout the Plan-period of the emerging MLP.
- 6.3 Using the findings of the sequential test, it can be seen that no sites included in the Proposed Submission MLP require the implementation of an 'exception test' to justify their inclusion in the Plan.



## **Appendix 1: Map of Sites/Areas**



# HERTFORDSHIRE COUNTY COUNCIL

Updated Level 1 SFRA

December 2018

Emerging Minerals Local  
Plan SFRA Sites Map

## KEY

### Mineral Sites

PSMLP Specific Site

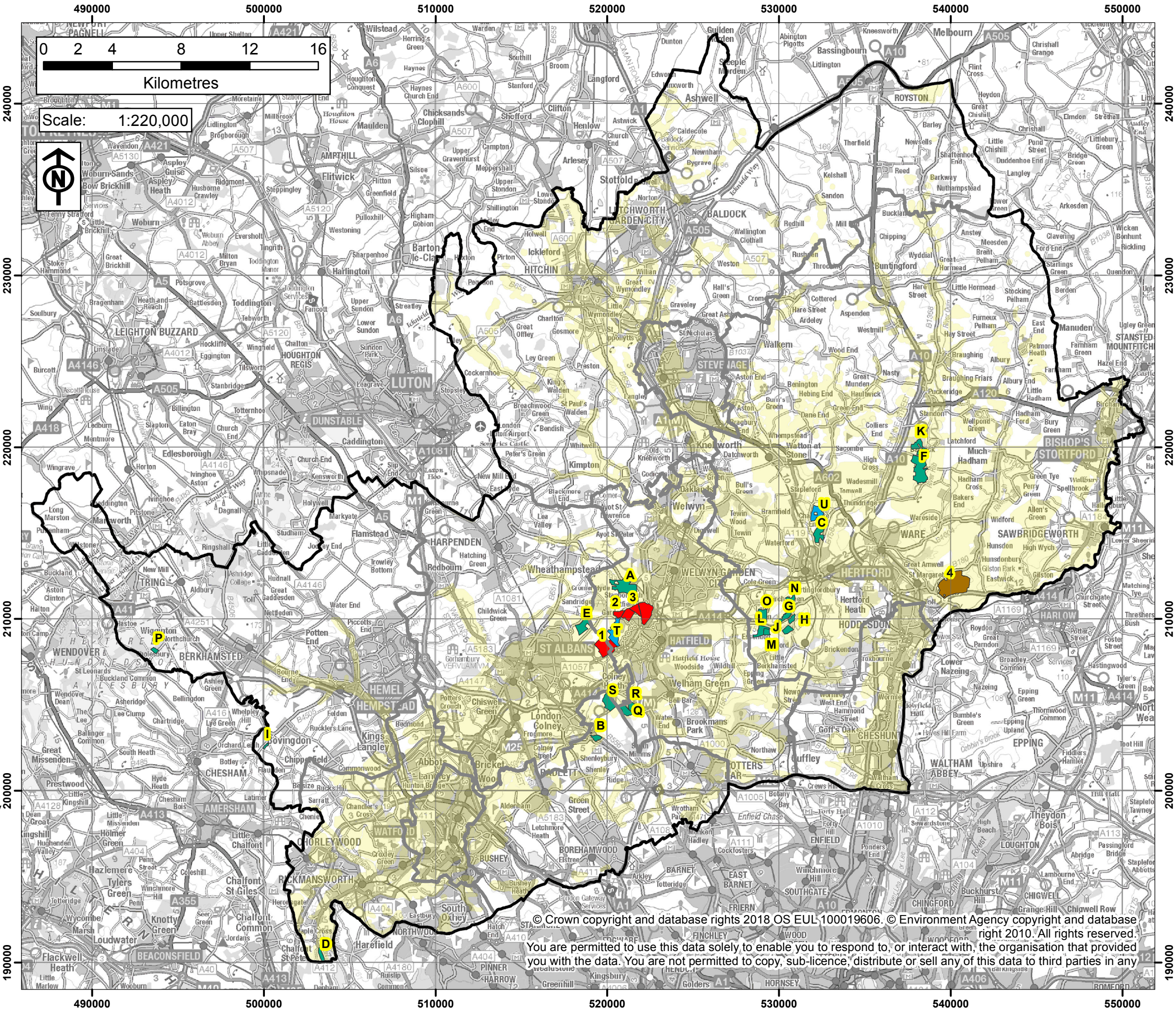
PSMLP Preferred Area

Omitted Site

Omitted Preferred Area

Mineral Safeguarding Area

- 1 Specific Site 1: Hatfield Aerodrome
- 2 Specific Site 2: Hatfield Quarry - Furze Field
- 3 Specific Site 3: Hatfield Quarry - Land adjoining Coopers Green Lane
- 4 Preferred Area 1: The Briggens Estate (Olives Farm)
- A MLPCS001RS: Land at Cromer Hyde Farm
- B MLPCS002: Salisbury Hall
- C MLPCS003: Land at Ware Park
- D MLPCS004: Land at Pynesfield
- E MLPCS005: Nashes and Fairfolds Farm
- F MLPCS007: Barwick
- G MLPCS011: Waterhall Farm Fields
- H MLPCS012: Waterhall Broad Green
- I MLPCS013: Harry's Field
- J MLPCS014: Waterhall Bunkers Hill South
- K MLPCS015: Plashes Farm
- L MLPCS016: Waterhall Howe Green
- M MLPCS017: Robins Nest Hill
- N MLPCS018: Southfield Wood East
- O MLPCS019: Pipers End
- P MLPCS020: Roundhill Wood
- Q MLPCS021: North Mymms (West)
- R MLPCS022: North Mymms (East)
- S MLPCS023: Warren Farm
- T (Adopted) PA1: Former BAe Site
- U (Adopted) PA2: Land adjoining Rickneys Quarry





## **Appendix 2: Individual Sequential Tests**

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520000

520500

0 70 140 280 420 560  
Metres



209000

208500

208000

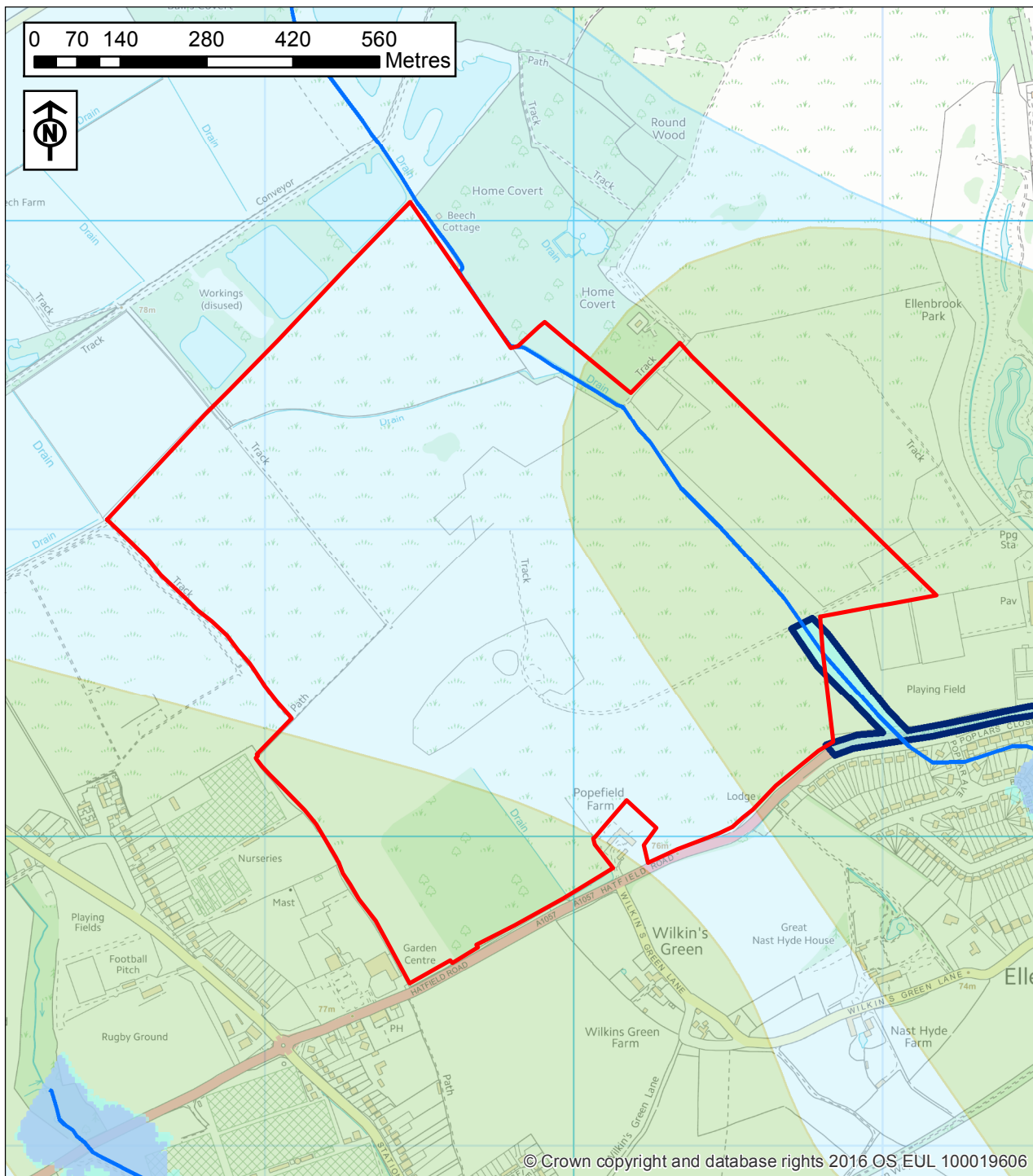
207500

209000

208500

208000

207500



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Updated Addendum to the Level 1 SFRA, December 2018

## Map 1a - Specific Site 1: Hatfield Aerodrome

### KEY

PSMLP Specific Site

Main Rivers

Historic Flood Map

Lake, Inland Water or Reservoir

Flood Warning Areas

### Flood Zones

Flood Zone 3

Flood Zone 2

### Groundwater Source

#### Protection Zone

Zone I - Inner Protection Zone

Zone II - Outer Protection Zone

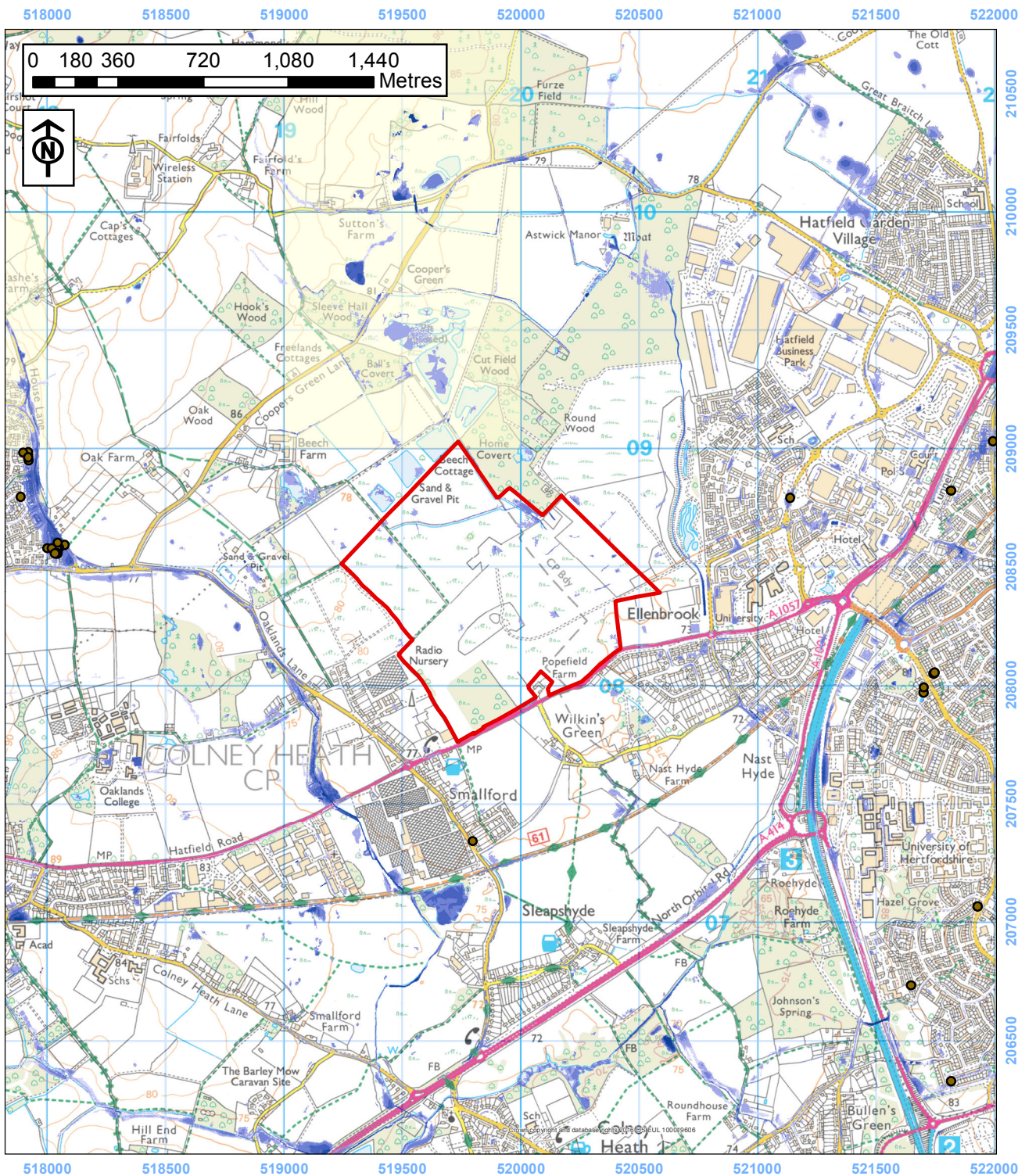
Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 Map 1b - Specific Site 1: Hatfield Aerodrome

### **KEY**

  PSMLP Specific Site

### Groundwater Flood Risk

$\geq 75\%$

$\geq 50\% < 75\%$

$\geq 25\% < 50\%$

$< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

### Flooding

Depth (m)

<span style="display: inline-block; width: 15px; height: 15px; background-color: #E6E6FA; border: 1px solid black;"></span> 0.00 - 0.15	<span style="display: inline-block; width: 15px; height: 15px; background-color: #483D8B; border: 1px solid black;"></span> 0.60 - 0.90
<span style="display: inline-block; width: 15px; height: 15px; background-color: #9370DB; border: 1px solid black;"></span> 0.15 - 0.30	<span style="display: inline-block; width: 15px; height: 15px; background-color: #000080; border: 1px solid black;"></span> 0.90 - 1.20
<span style="display: inline-block; width: 15px; height: 15px; background-color: #6A5ACD; border: 1px solid black;"></span> 0.30 - 0.60	<span style="display: inline-block; width: 15px; height: 15px; background-color: #000080; border: 1px solid black;"></span> $> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000

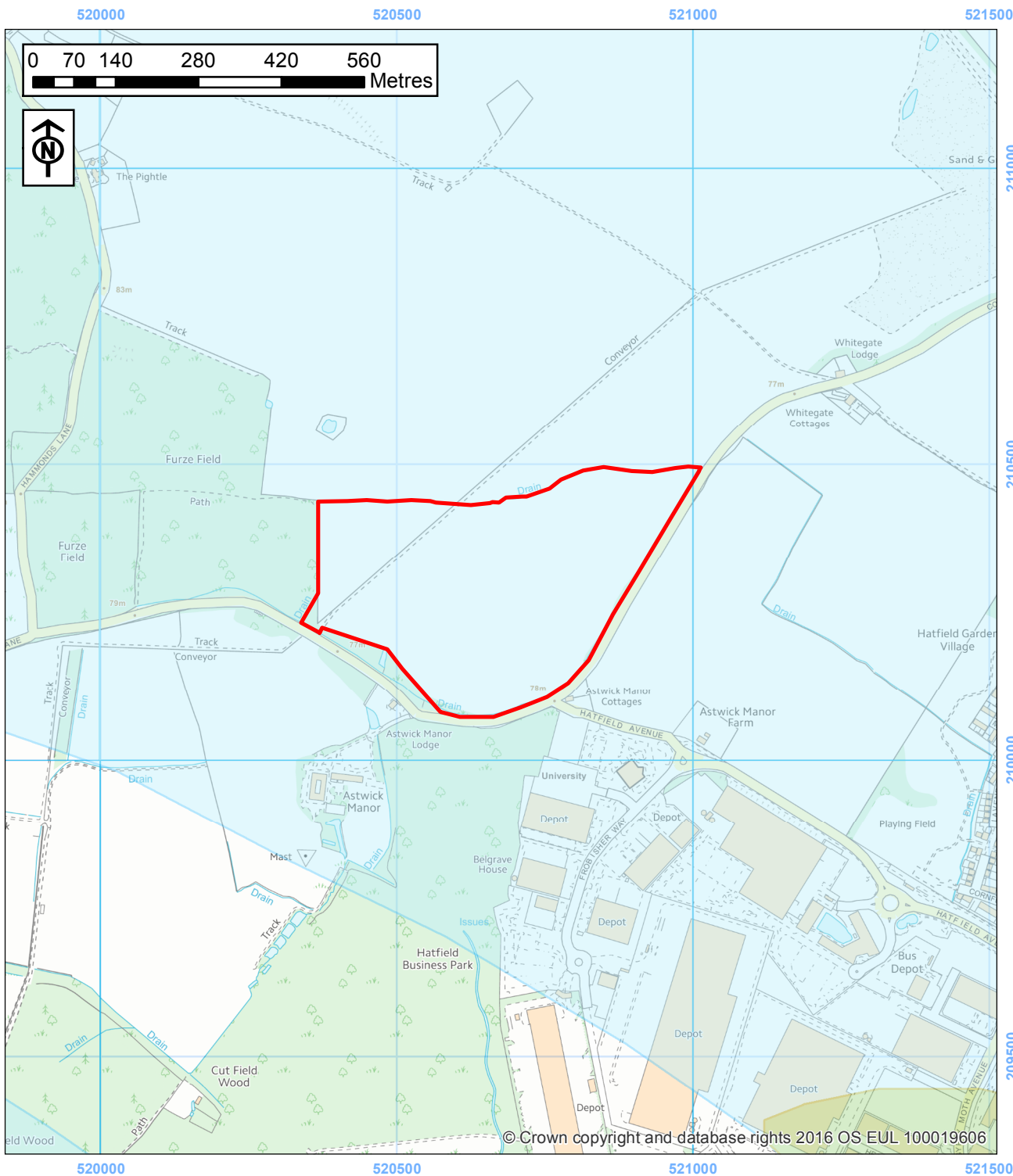


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# Updated Addendum to the Level 1 SFRA, December 2018

## Map 2a - Specific Site 2: Hatfield Quarry - Furze Field

### KEY

PSMLP Specific Site

Main Rivers

Historic Flood Map

Lake, Inland Water or Reservoir

Flood Warning Areas

### Flood Zones

Flood Zone 3

Flood Zone 2

### Groundwater Source

#### Protection Zone

Zone I - Inner Protection Zone

Zone II - Outer Protection Zone

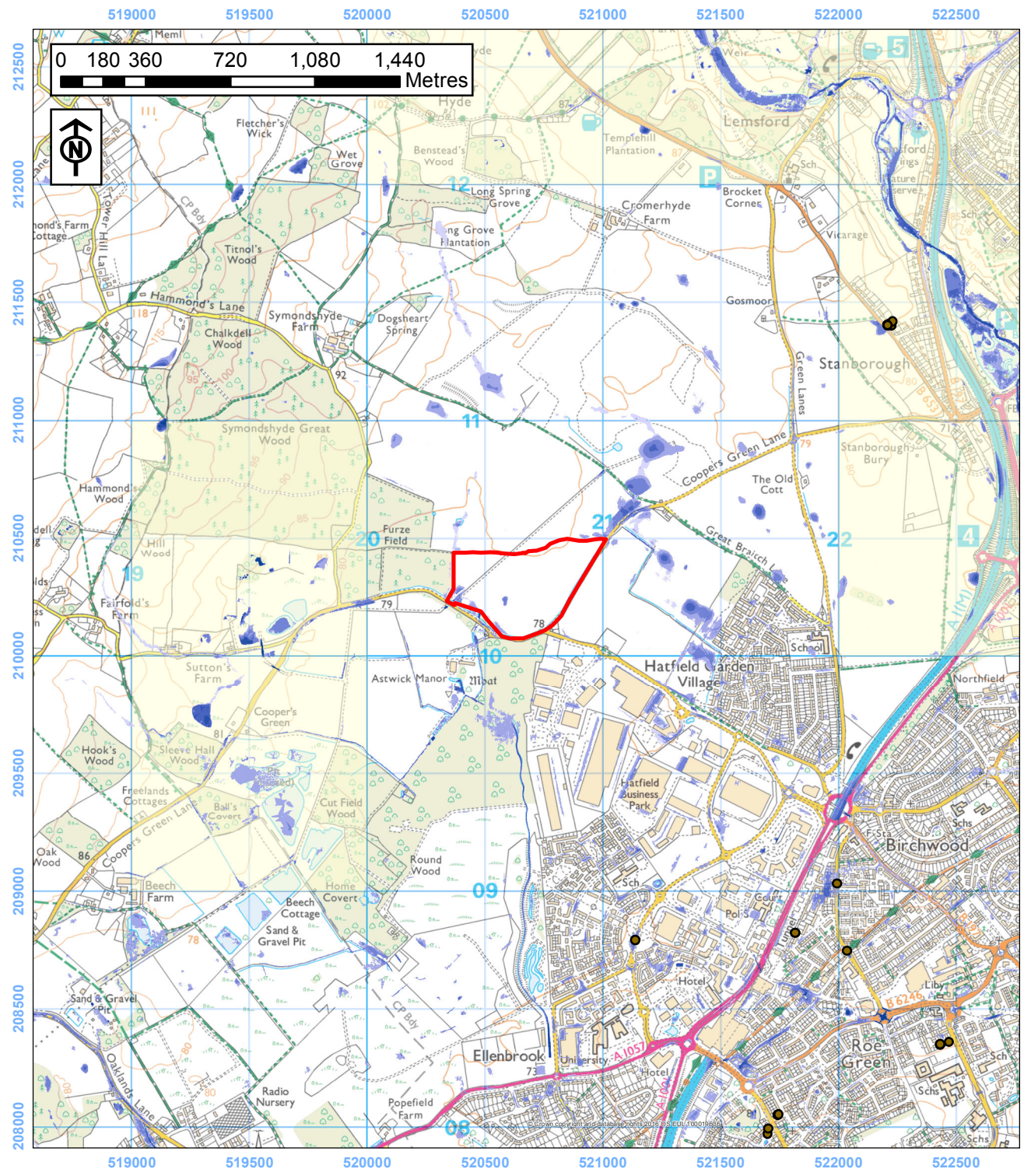
Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 2b - Specific Site 2: Hatfield Quarry - Furze Field**

**KEY**

PSMLP Specific Site

Groundwater Flood Risk

$\geq 75\%$   
  $\geq 50\% < 75\%$   
  $\geq 25\% < 50\%$   
  $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



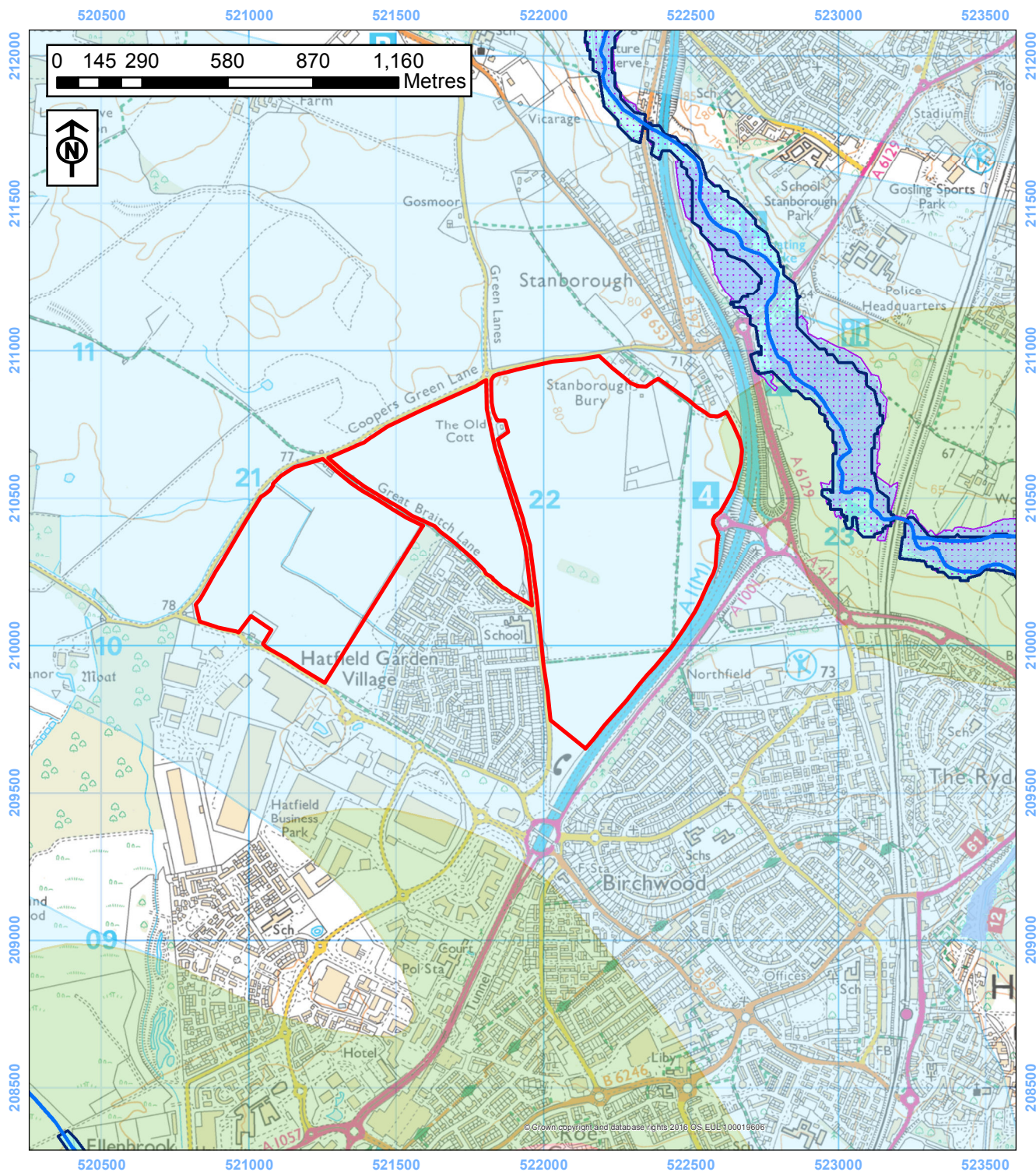
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 3a - Specific Site 2: Hatfield Quarry -  
 Land adjoining Coopers Green Lane**

**KEY**

- PSMLP Specific Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

**Groundwater Source  
 Protection Zone**

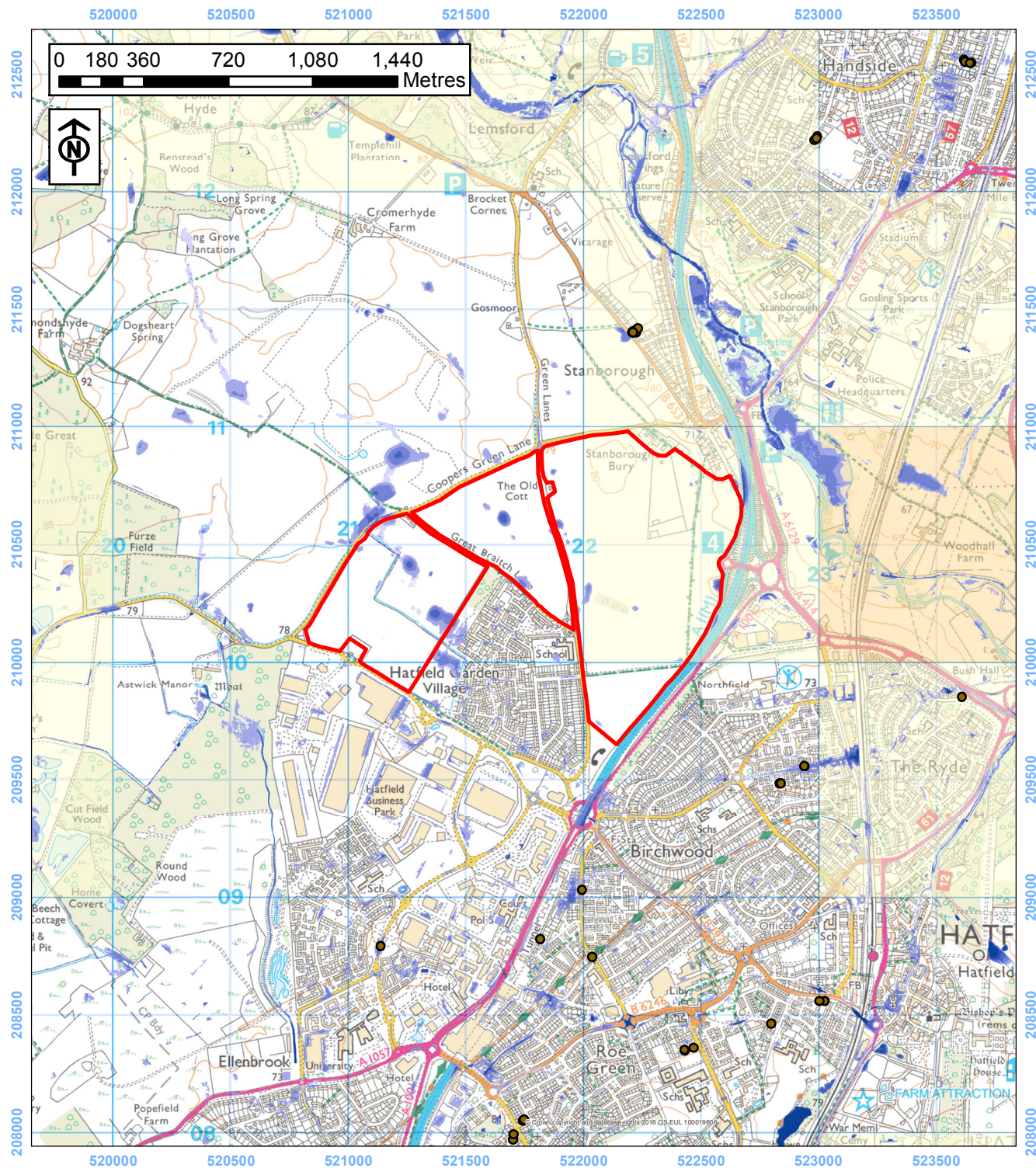
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:20,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 3b - Specific Site 3: Hatfield Quarry -  
 Land adjoining Coopers Green Lane**

**KEY**

PSMLP Specific Site

Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



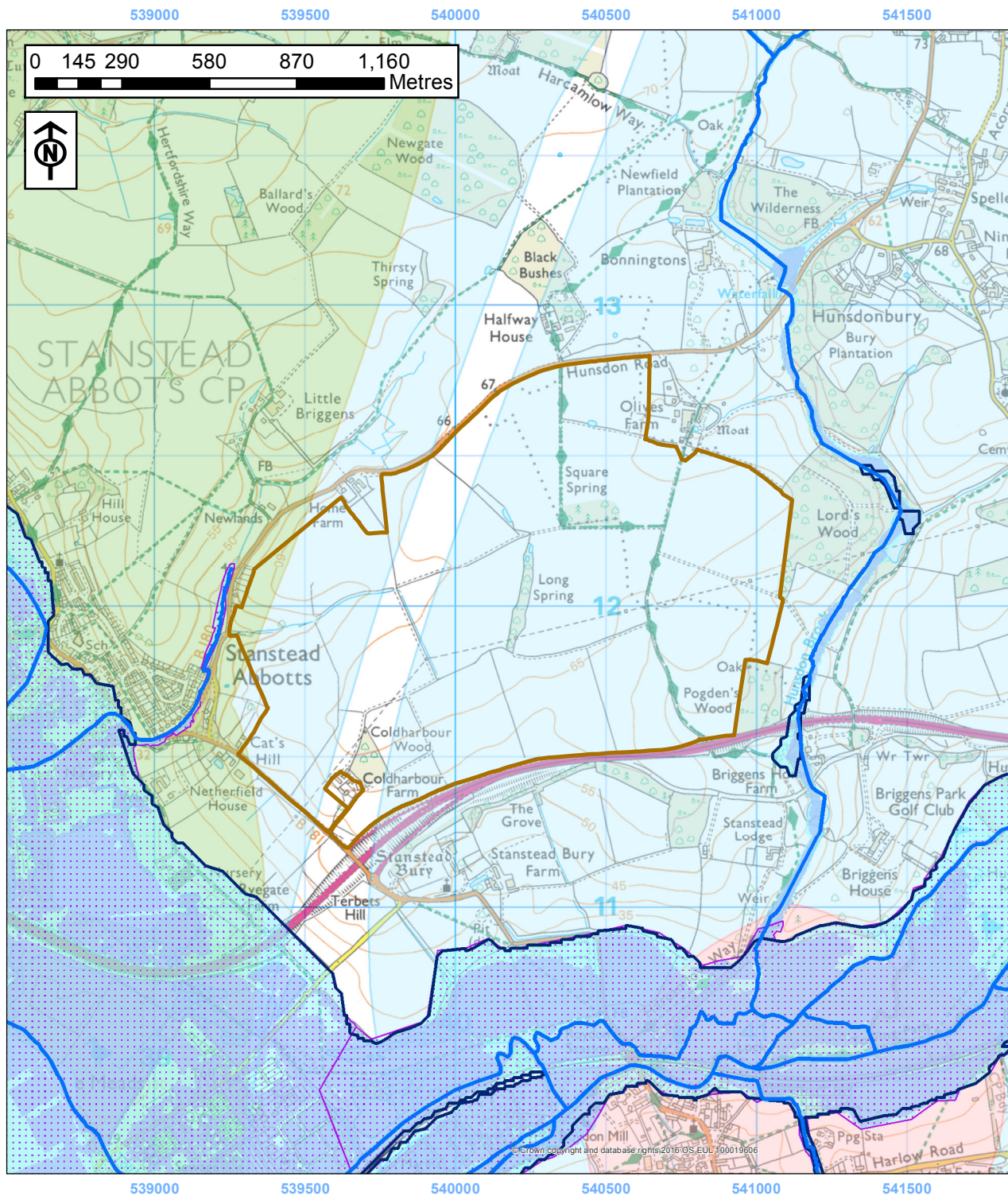
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 4a - Preferred Area 1: The Briggens Estate (Olives Farm)**

**KEY**

- PSMLP Preferred Area
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

**Groundwater Source Protection Zone**

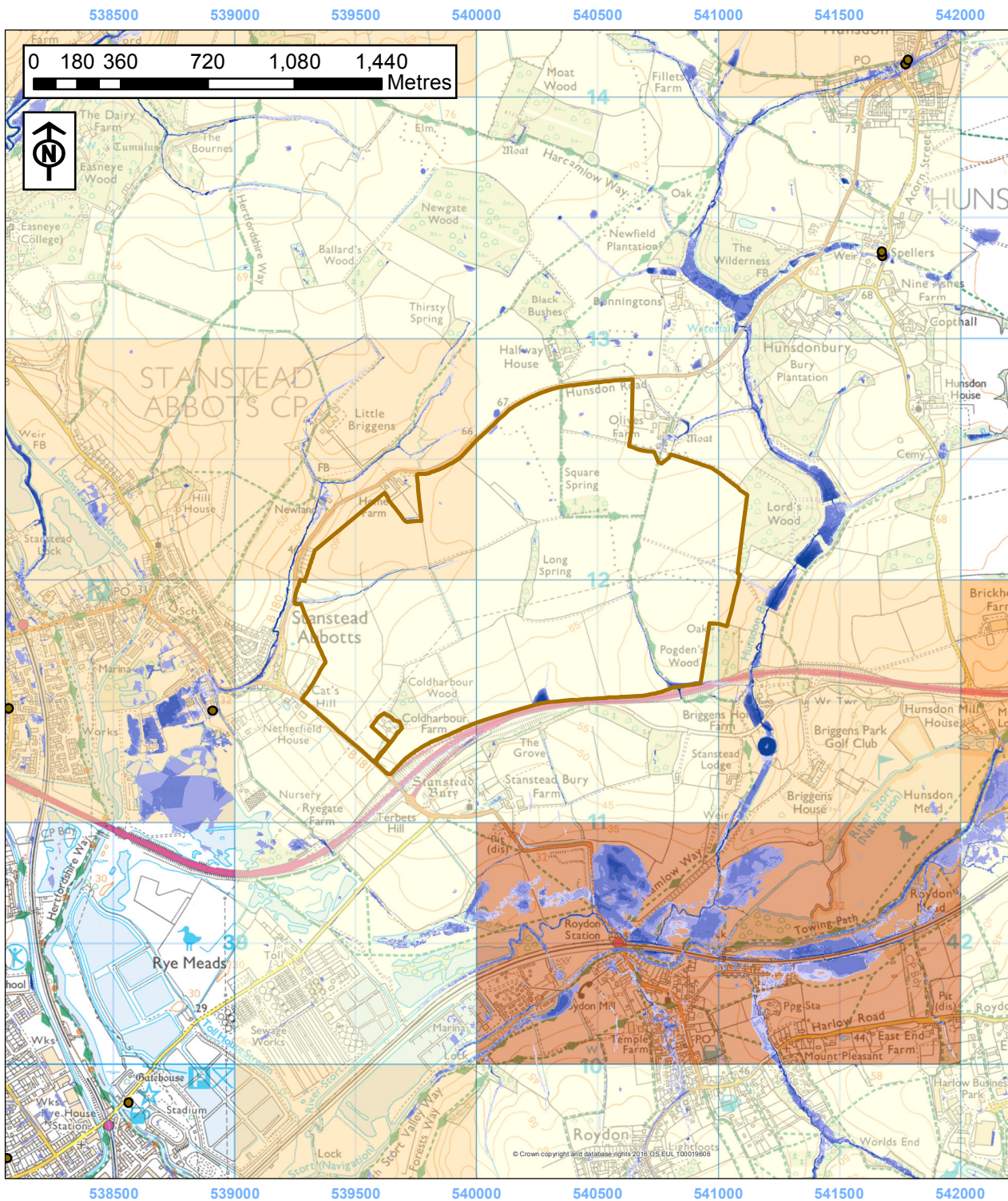
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:20,000



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# Updated Addendum to the Level 1 SFRA, December 2018 Map 4b - Preferred Area 1: The Briggens Estate (Olives Farm)


### **KEY**


 PSMLP Preferred Area

### Groundwater Flood Risk

  $\geq 75\%$

  $\geq 50\% < 75\%$

  $\geq 25\% < 50\%$

  $< 25\%$







### LLFA Flood Incident Record

 Flood Incident Record\*

### Surface Water

### Flooding

Depth (m)

 0.00 - 0.15	 0.60 - 0.90
 0.15 - 0.30	 0.90 - 1.20
 0.30 - 0.60	 $> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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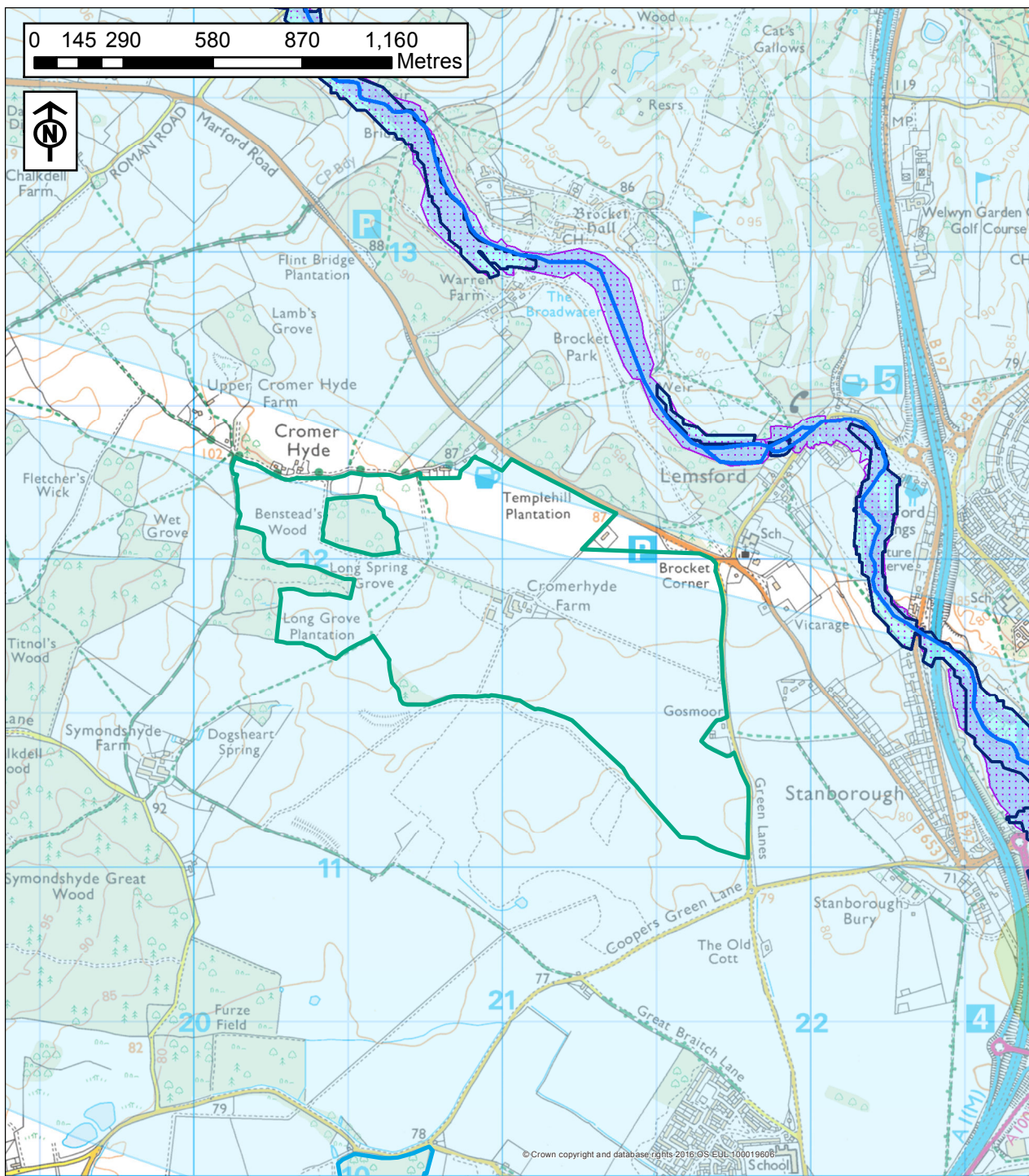
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519500 520000 520500 521000 521500 522000 522500

0 145 290 580 870 1,160 Metres



# Updated Addendum to the Level 1 SFRA, December 2018 Map 5a - MLPCS001RS: Land at Cromer Hyde Farm

## KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

## Flood Zones

- Flood Zone 3
- Flood Zone 2

## Groundwater Source Protection Zone

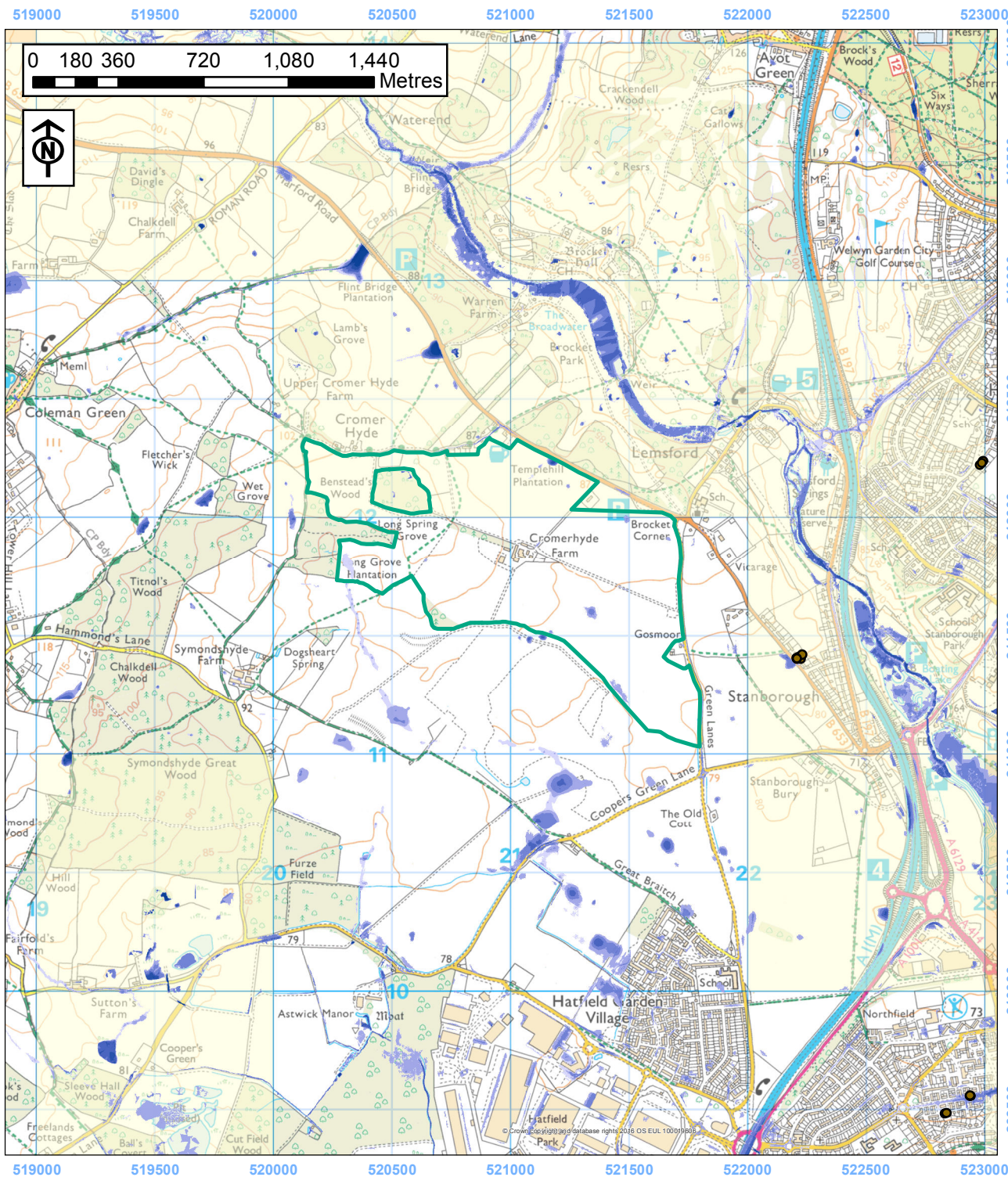
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:20,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 5b - MLPCS001RS: Land at Cromer Hyde Farm**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000

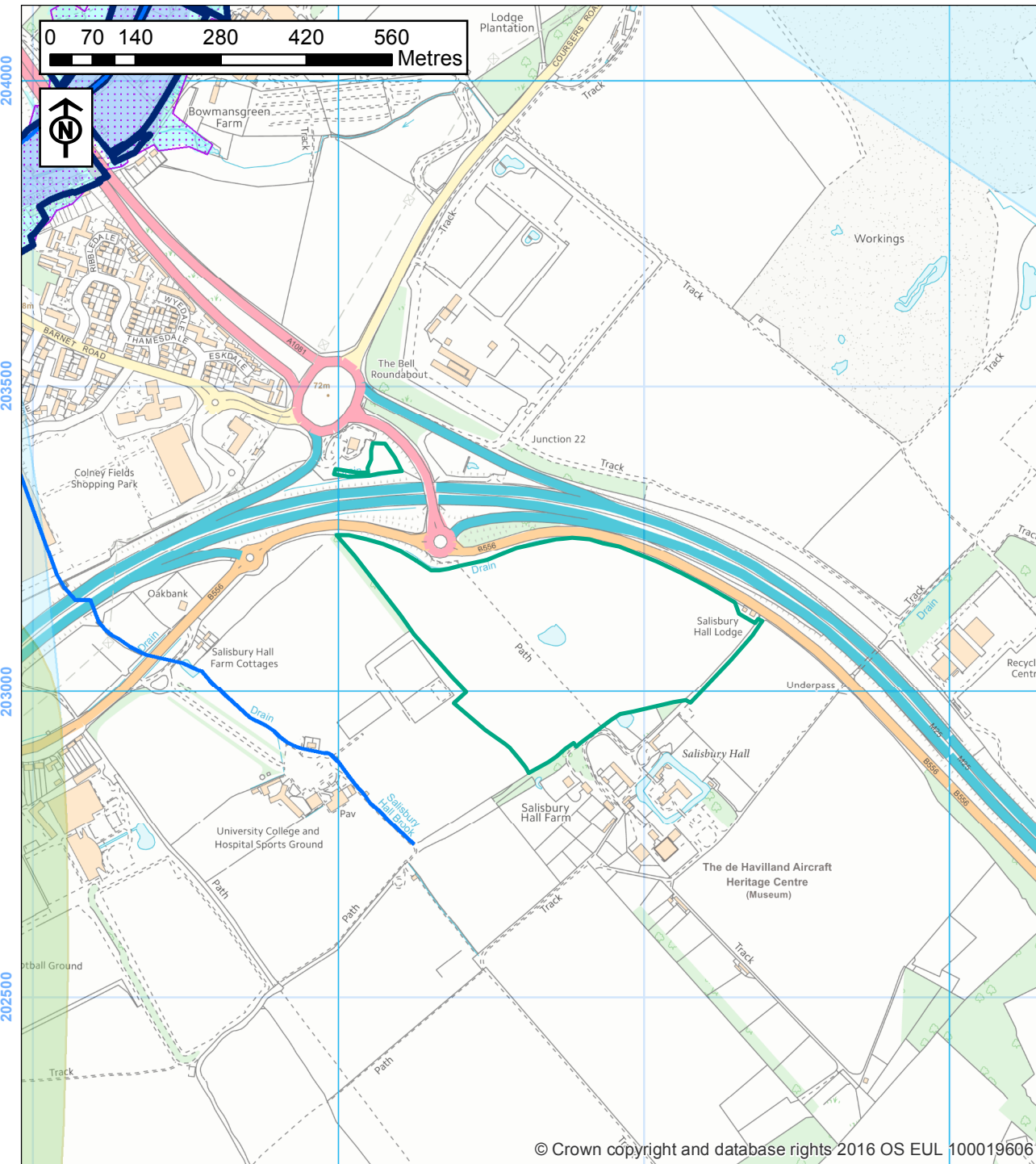


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518500 519000 519500 520000

0 70 140 280 420 560 Metres



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## Updated Addendum to the Level 1 SFRA, December 2018 Map 6a - MLPCS002: Salisbury Hall

### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

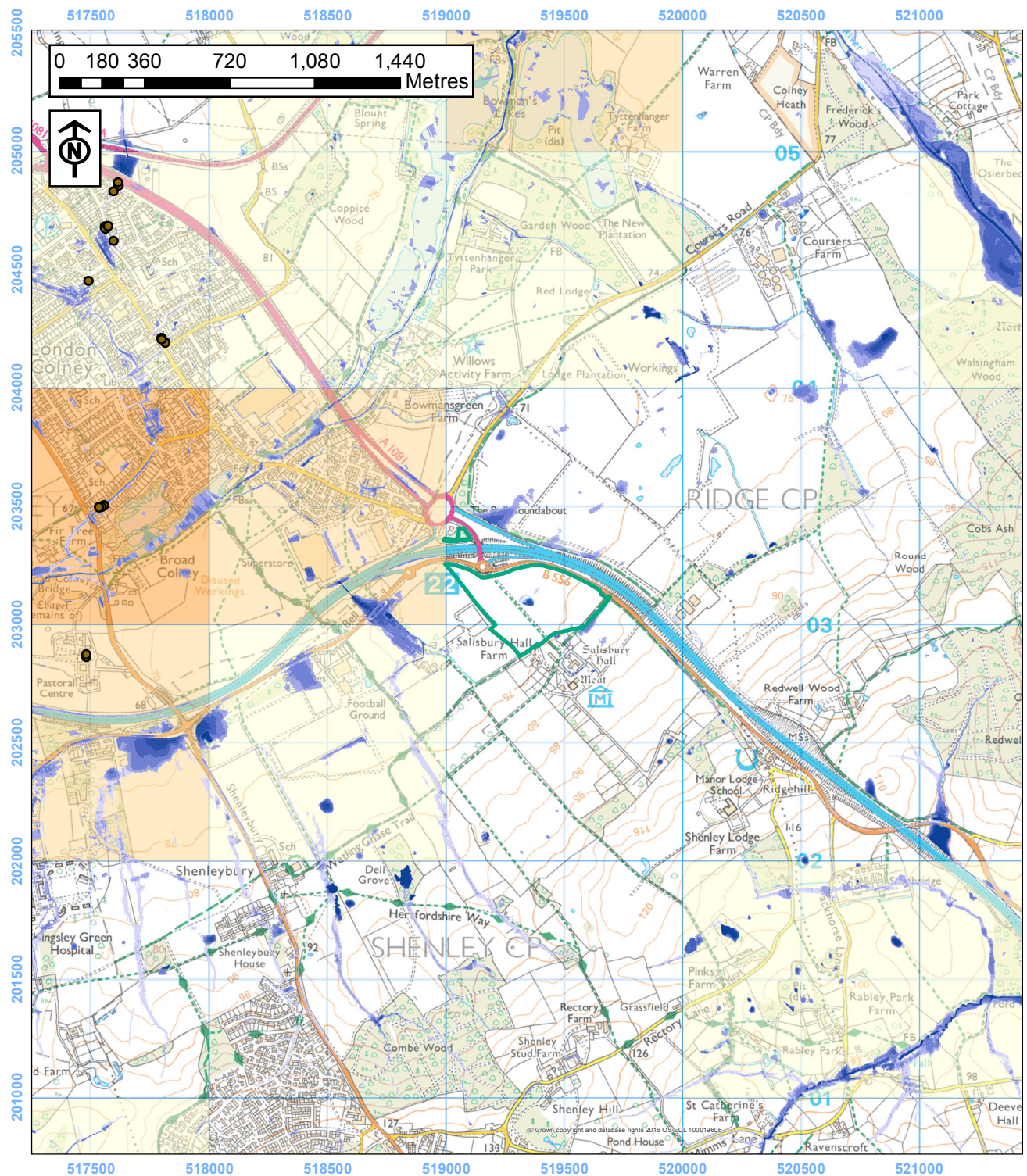
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 Map 6b - MLPCS002: Salisbury Hall


## **KEY**


 Omitted Site

## Groundwater Flood Risk

  $\geq 75\%$

  $\geq 50\% < 75\%$

  $\geq 25\% < 50\%$

  $< 25\%$

## LLFA Flood Incident Record


 Flood Incident Record\*


## Surface Water


## Flooding


Depth (m)


 0.00 - 0.15

 0.15 - 0.30

 0.30 - 0.60

 0.60 - 0.90

 0.90 - 1.20

  $> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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531500

532000

532500

533000

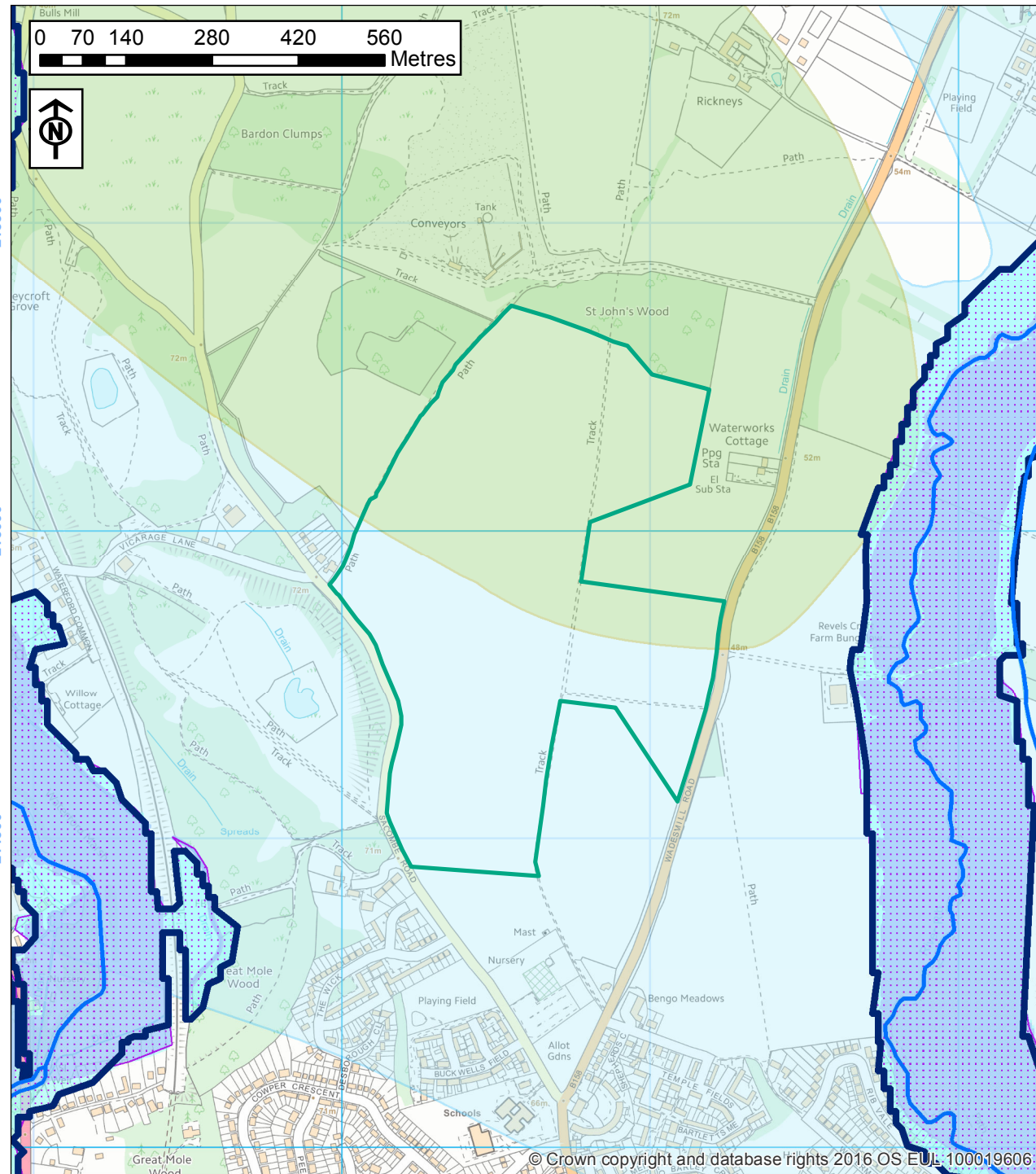
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Metres

215500

215000

214500

214000



531500

532000

532500

533000

## Updated Addendum to the Level 1 SFRA, December 2018 Map 7a - MLPCS003: Land at Ware Park

### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

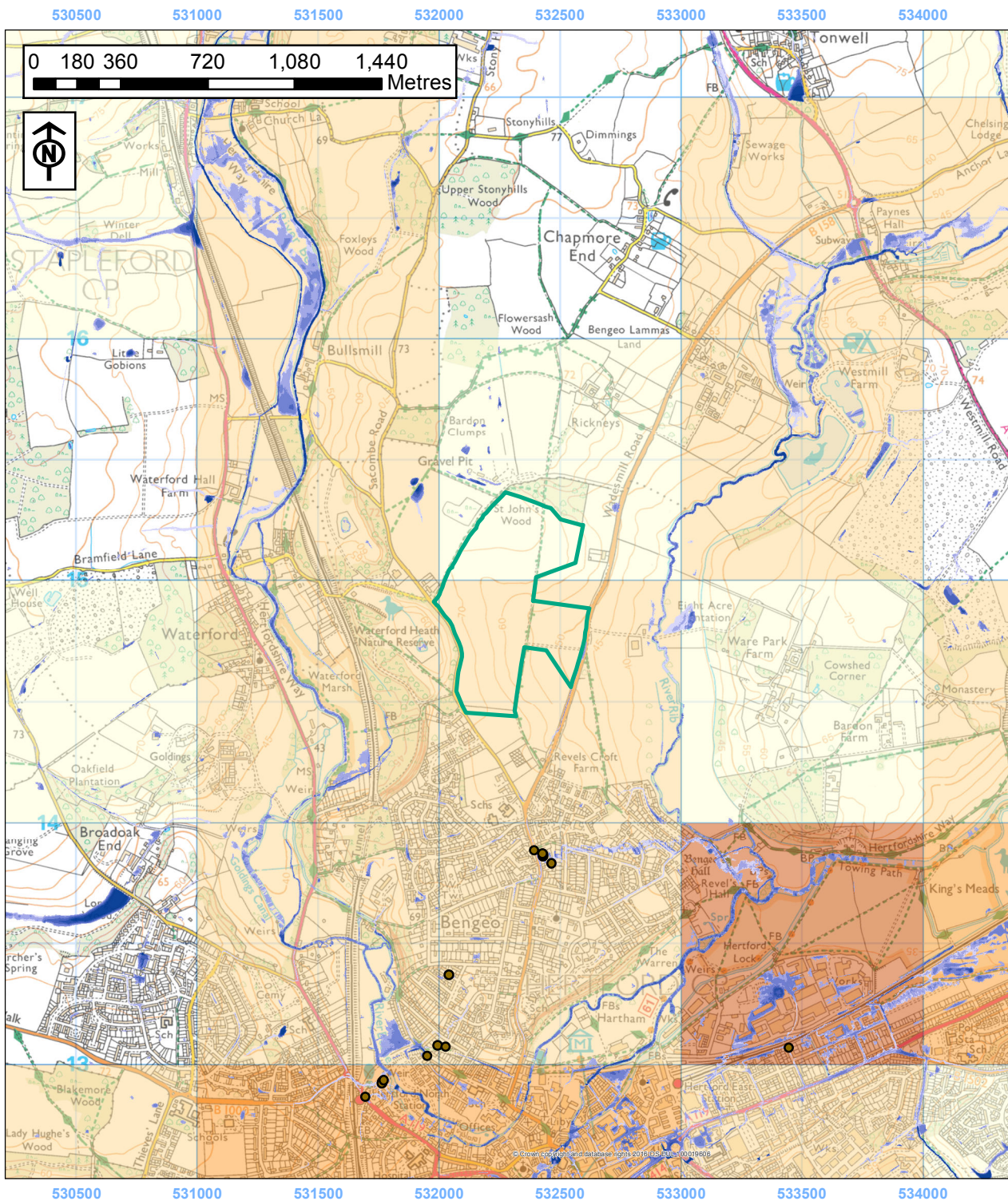
Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 7b - MLPCS003: Land at Ware Park**

## **KEY**

Omitted Site

## Groundwater Flood Risk

$\geq 75\%$

$\geq 50\% < 75\%$

$\geq 25\% < 50\%$

$< 25\%$

## LLFA Flood Incident Record

Flood Incident Record\*

## Surface Water

### Flooding

Depth (m)

0.00 - 0.15

0.60 - 0.90

0.15 - 0.30

0.90 - 1.20

0.30 - 0.60

$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



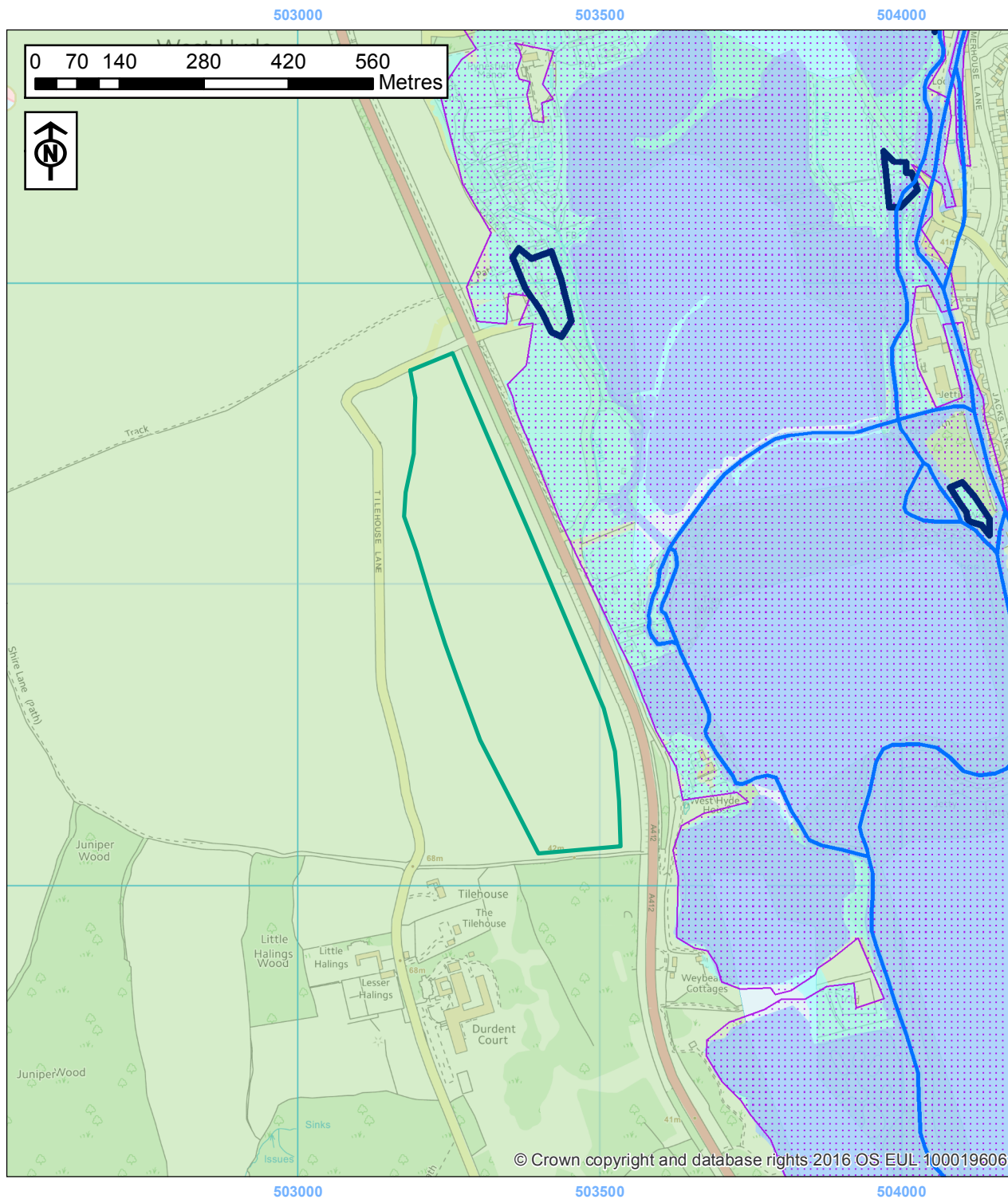
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 8a - MLPCS004: Land at Pynesfield**

**KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

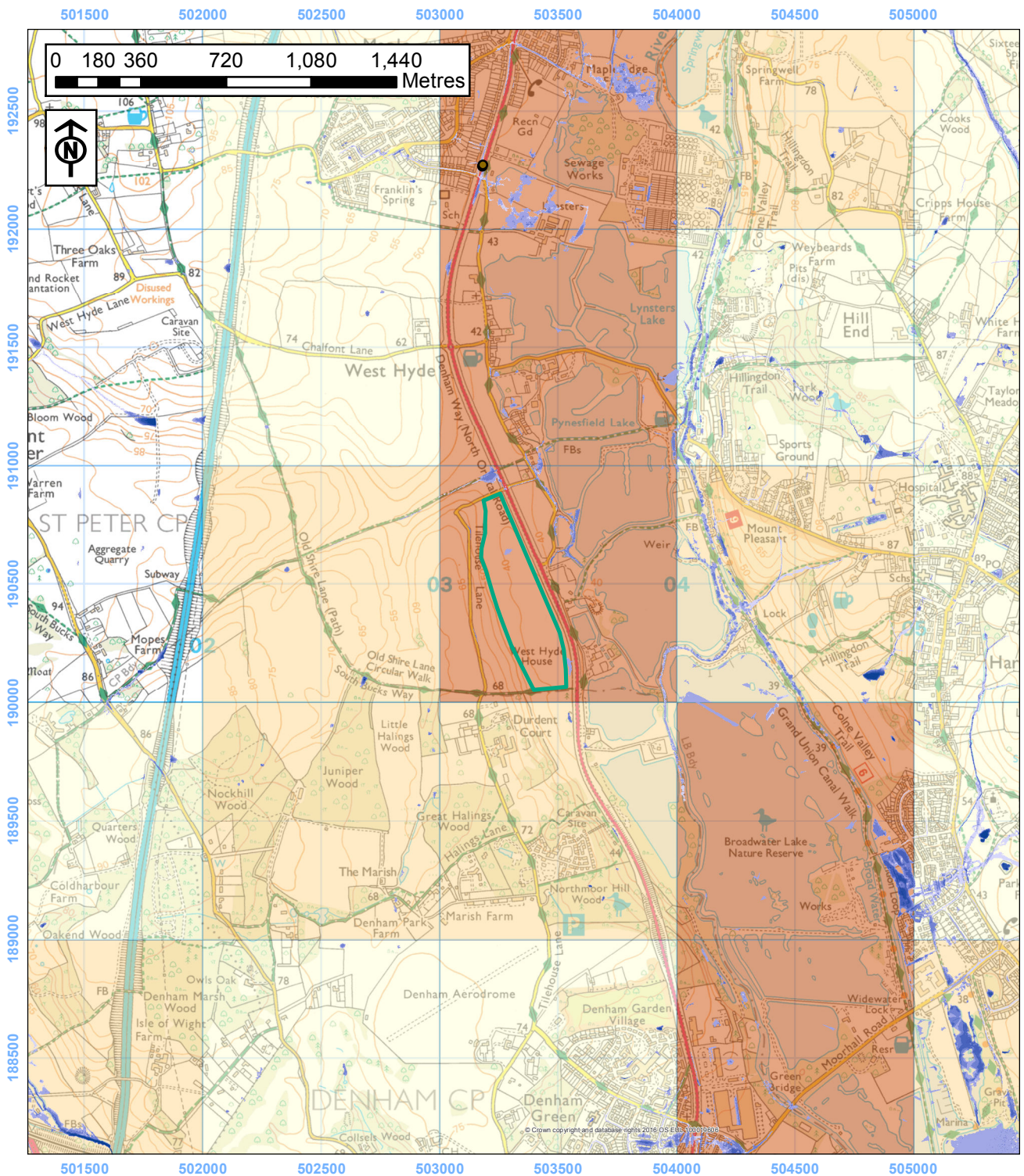
**Groundwater Source Protection Zone**

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 8b - MLPCS004: Land at Pynesfield**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water  
Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



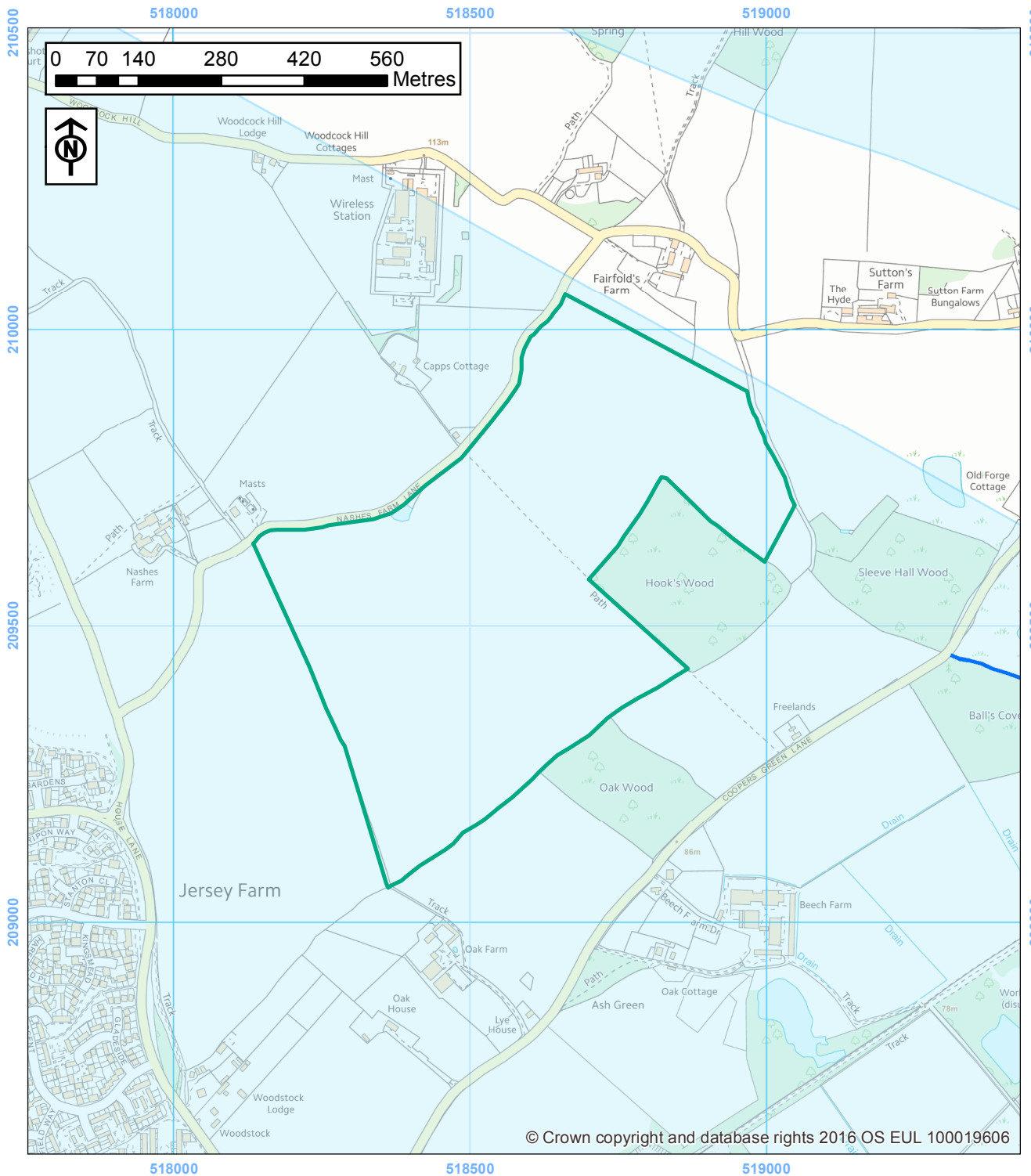
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 9a - MLPCS005: Nashes and Fairfolds Farm**

**KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

**Groundwater Source Protection Zone**

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

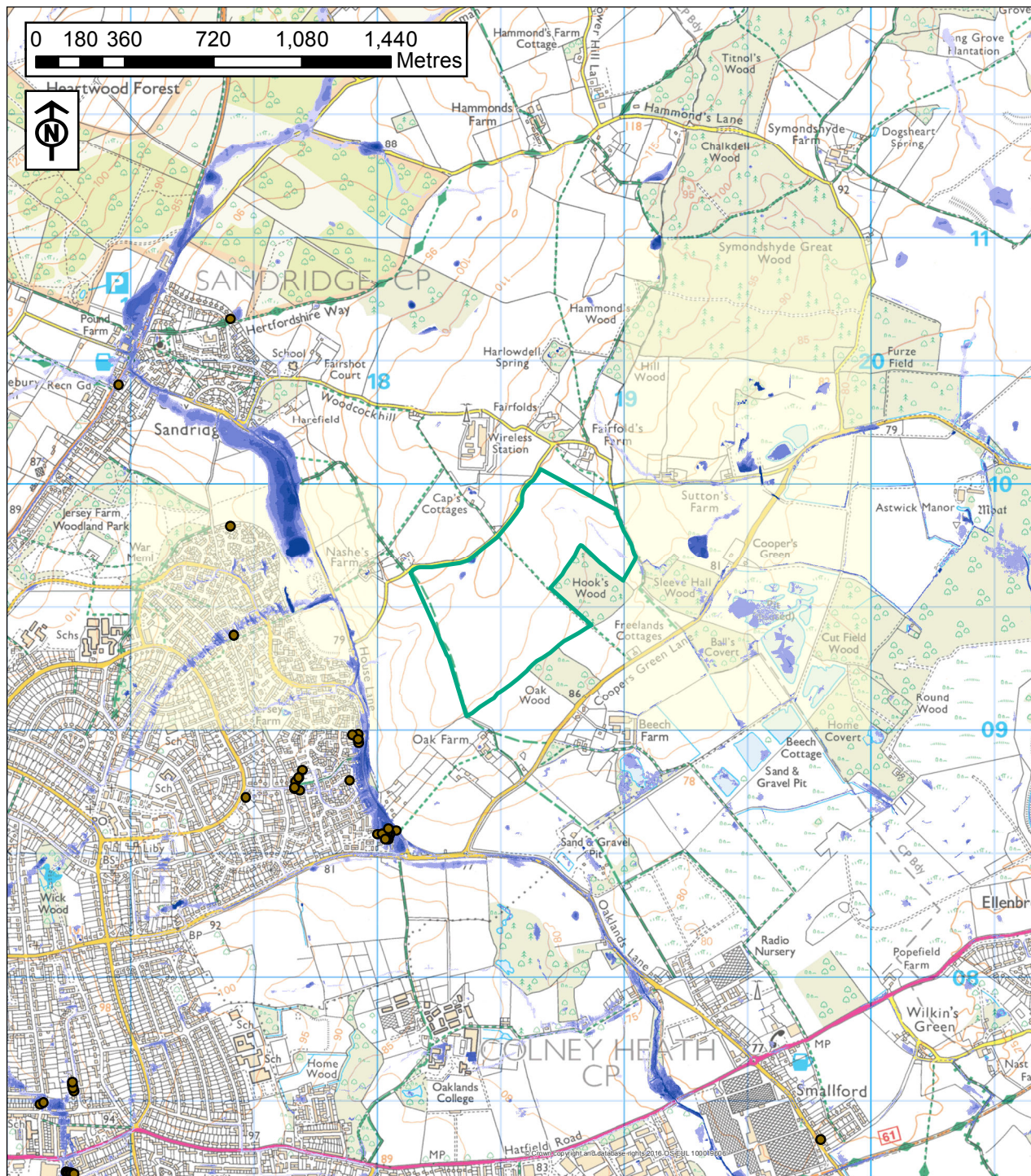
Scale: 1:10,000



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516500 517000 517500 518000 518500 519000 519500 520000 520500

0 180 360 720 1,080 1,440 Metres



Updated Addendum to the Level 1 SFRA, December 2018

## Map 9b - MLPCS005: Nashes and Fairfolds Farm

### KEY

Omitted Site

### Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

### Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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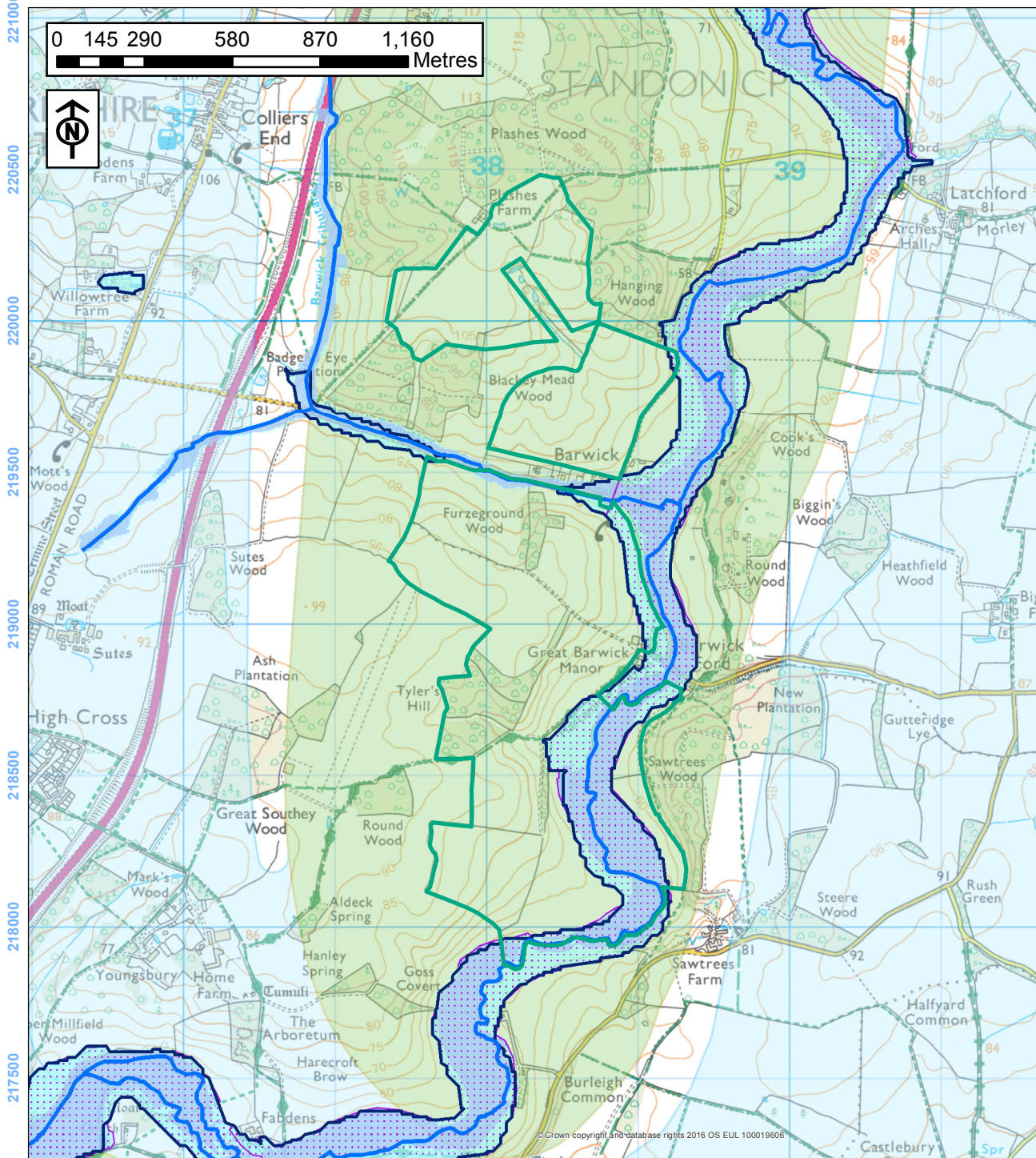
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516500 517000 517500 518000 518500 519000 519500 520000 520500



536500 537000 537500 538000 538500 539000 539500



Updated Addendum to the Level 1 SFRA, December 2018

## Map 10a - MLPCS007: Barwick

### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

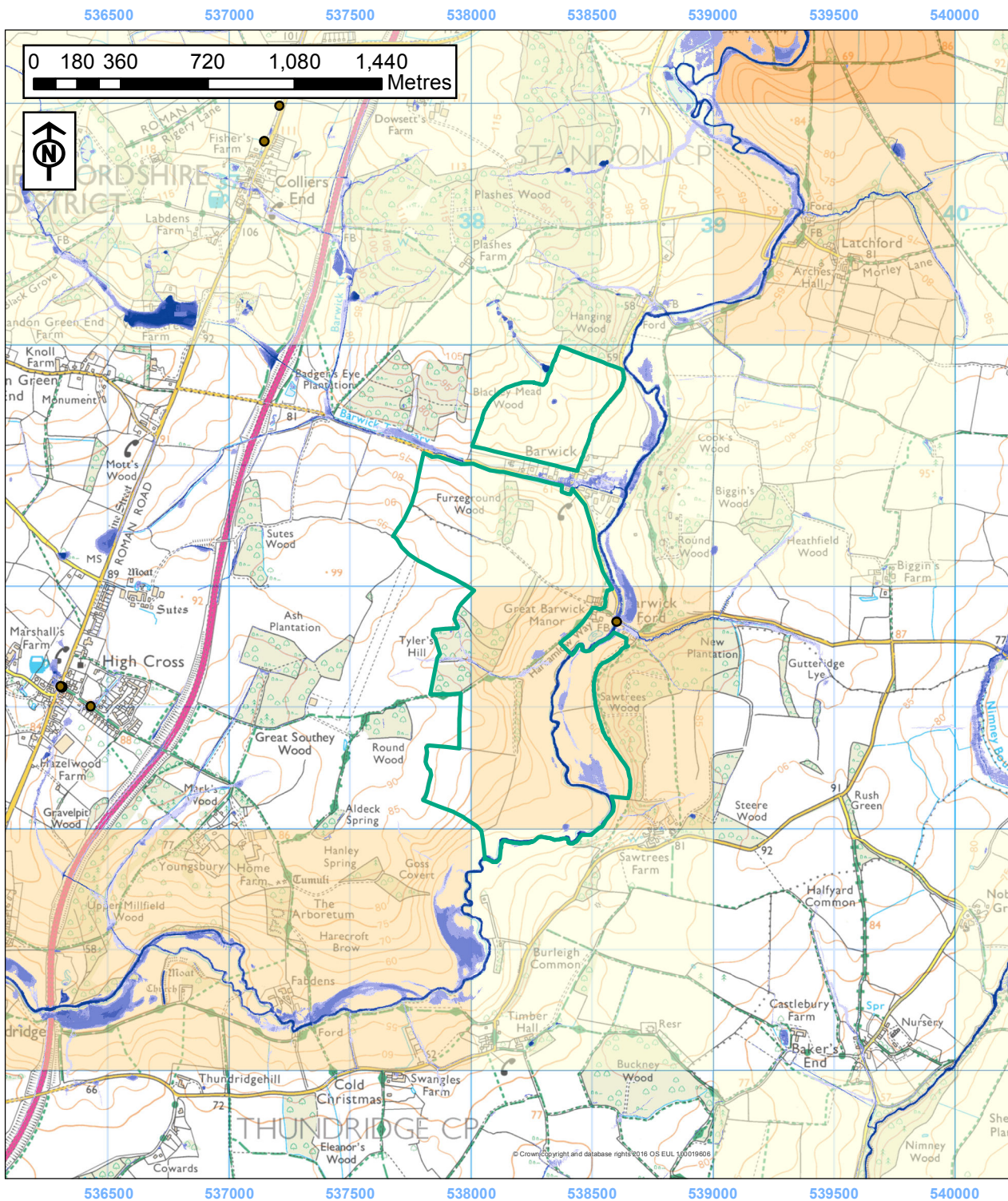
Scale: 1:20,000



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536500 537000 537500 538000 538500 539000 539500





Updated Addendum to the Level 1 SFRA, December 2018

## Map 10b - MLPCS007: Barwick

### KEY

Omitted Site

### Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000

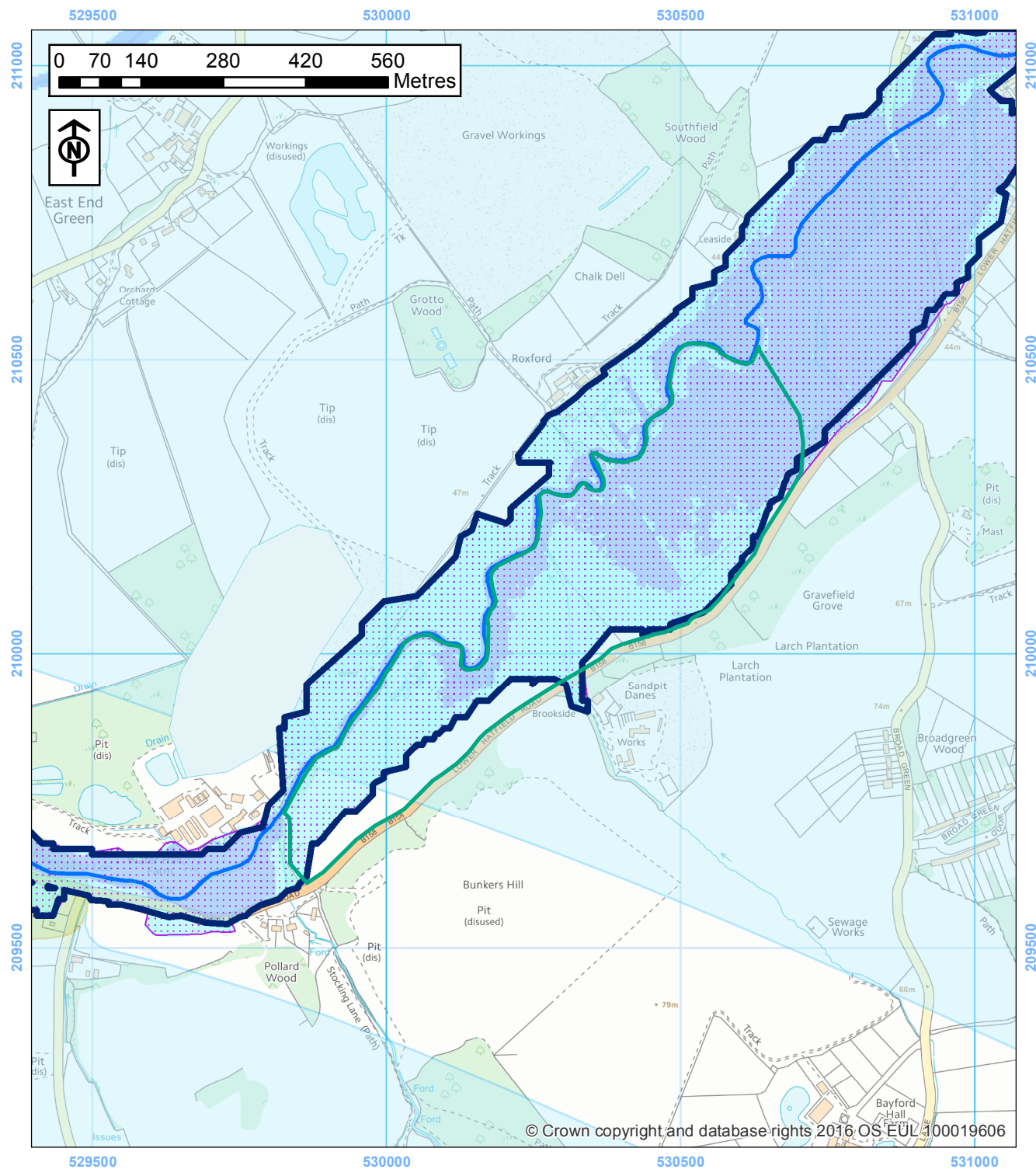


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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 11a - MLPCS011: Waterhall Farm Fields**

**KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

**Groundwater Source Protection Zone**

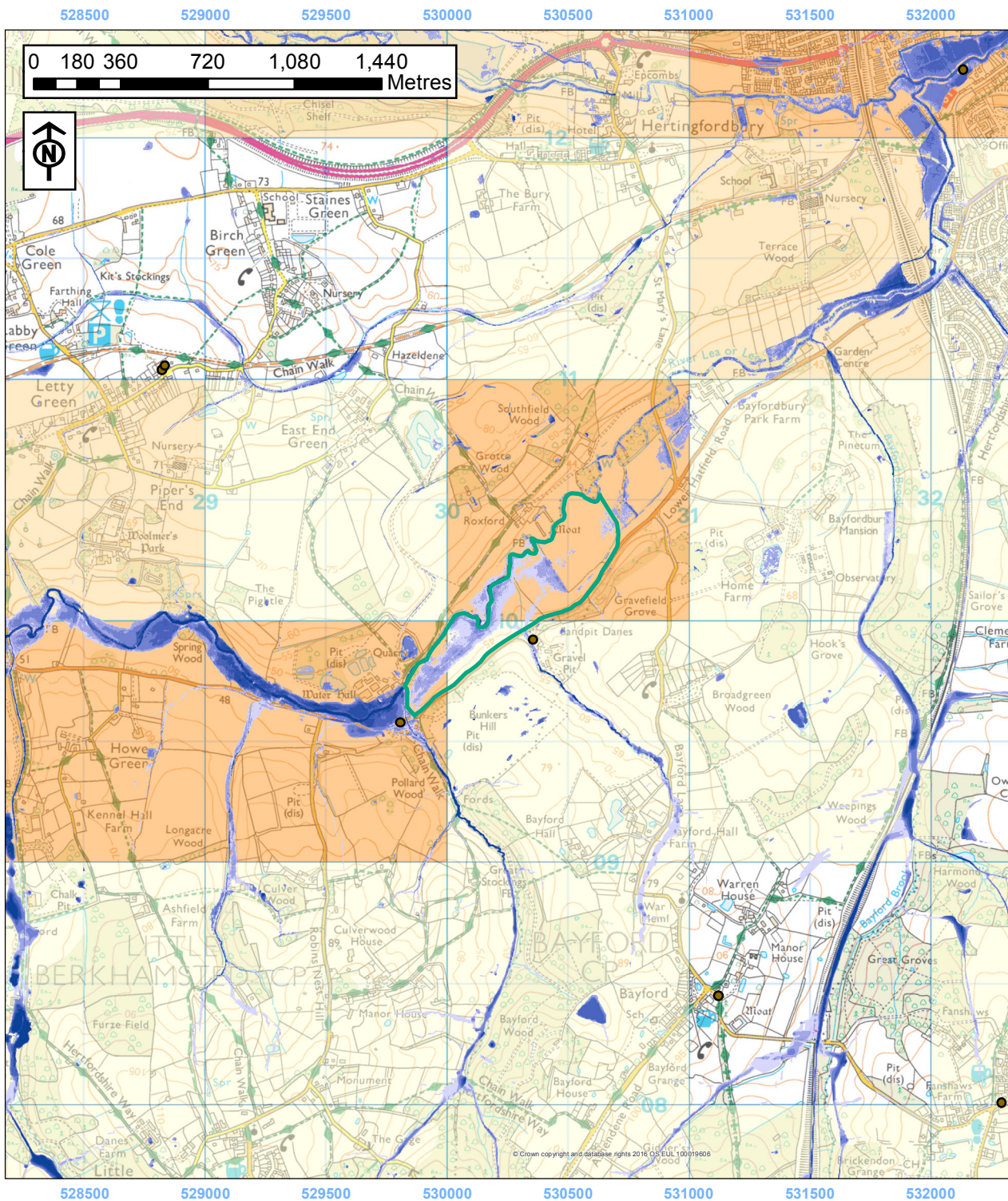
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 11b - MLPCS011: Waterhall Farm Fields**

## **KEY**

Omitted Site

## Groundwater Flood Risk

>= 75%

>= 50% < 75%

>= 25% < 50%

< 25%

## LLFA Flood Incident Record

Flood Incident Record\*

## Surface Water

### Flooding

Depth (m)

0.00 - 0.15

0.15 - 0.30

0.30 - 0.60

0.60 - 0.90

0.90 - 1.20

> 1.20

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



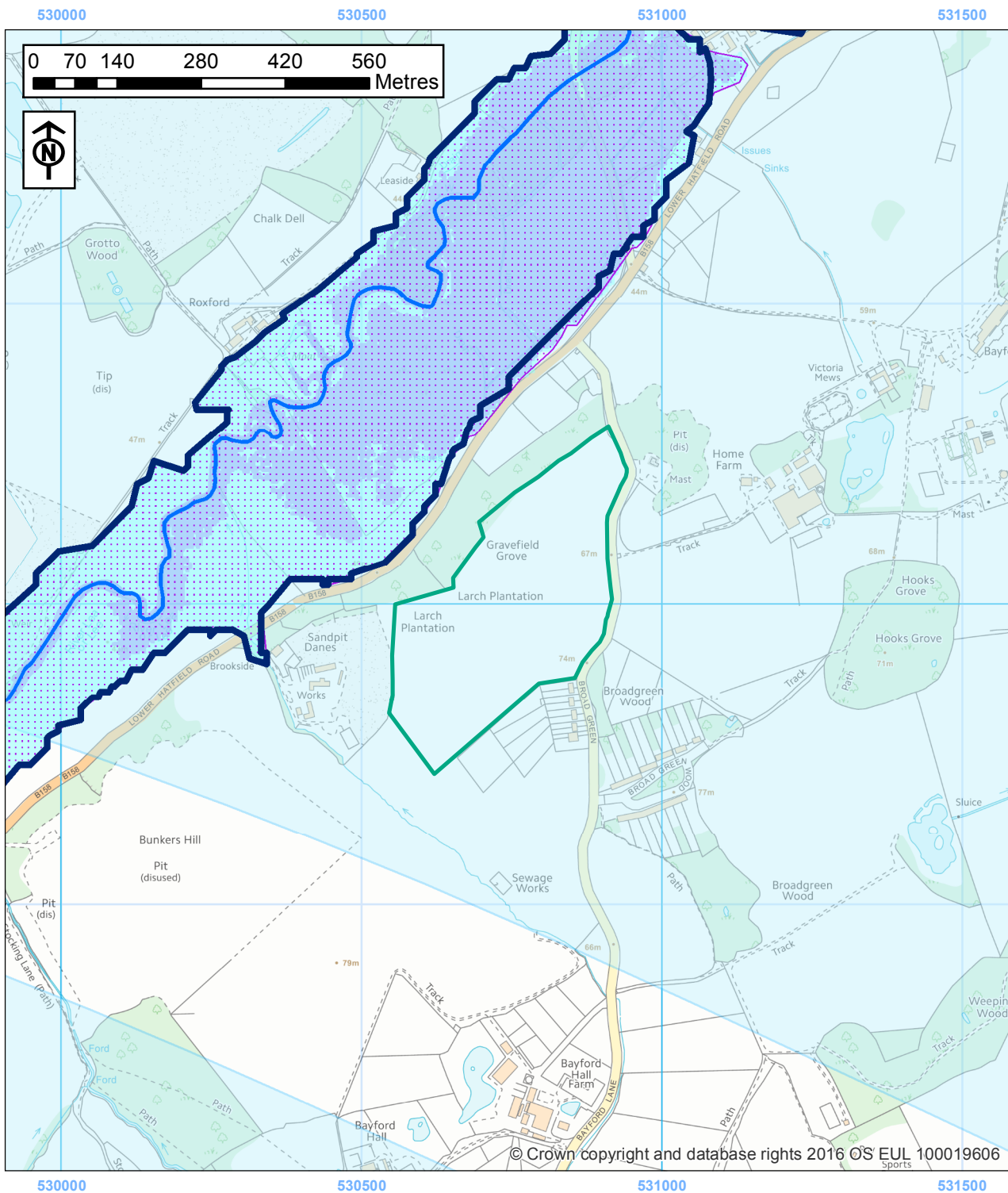
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# Updated Addendum to the Level 1 SFRA, December 2018 Map 12a - MLPCS012: Waterhall Broad Green

### **KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### **Flood Zones**

- Flood Zone 3
- Flood Zone 2

### **Groundwater Source Protection Zone**

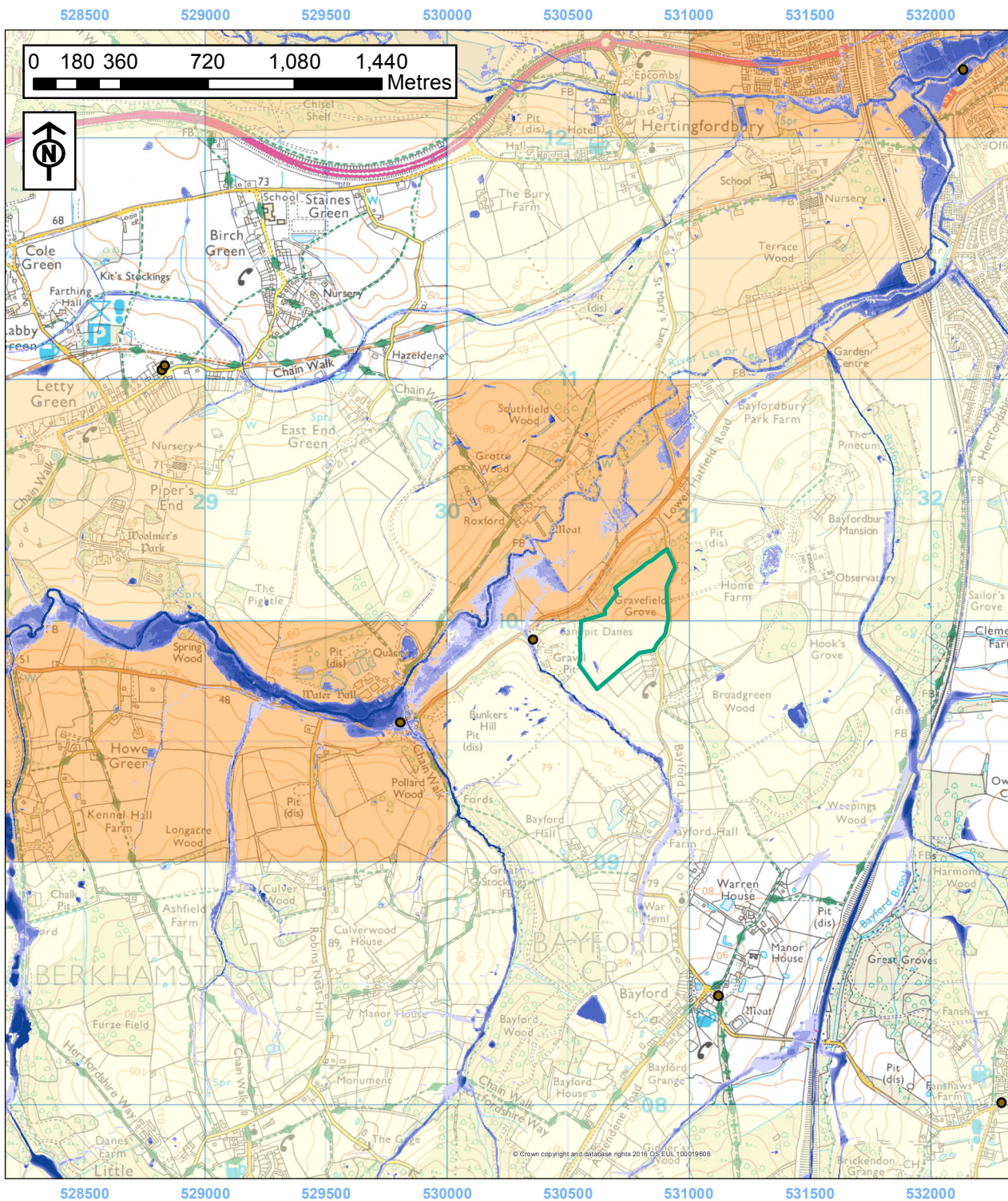
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 Map 12b - MLPCS012: Waterhall Broad Green

### **KEY**

Omitted Site

### Groundwater Flood Risk

$\geq 75\%$

$\geq 50\% < 75\%$

$\geq 25\% < 50\%$

$< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

#### Flooding

#### Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



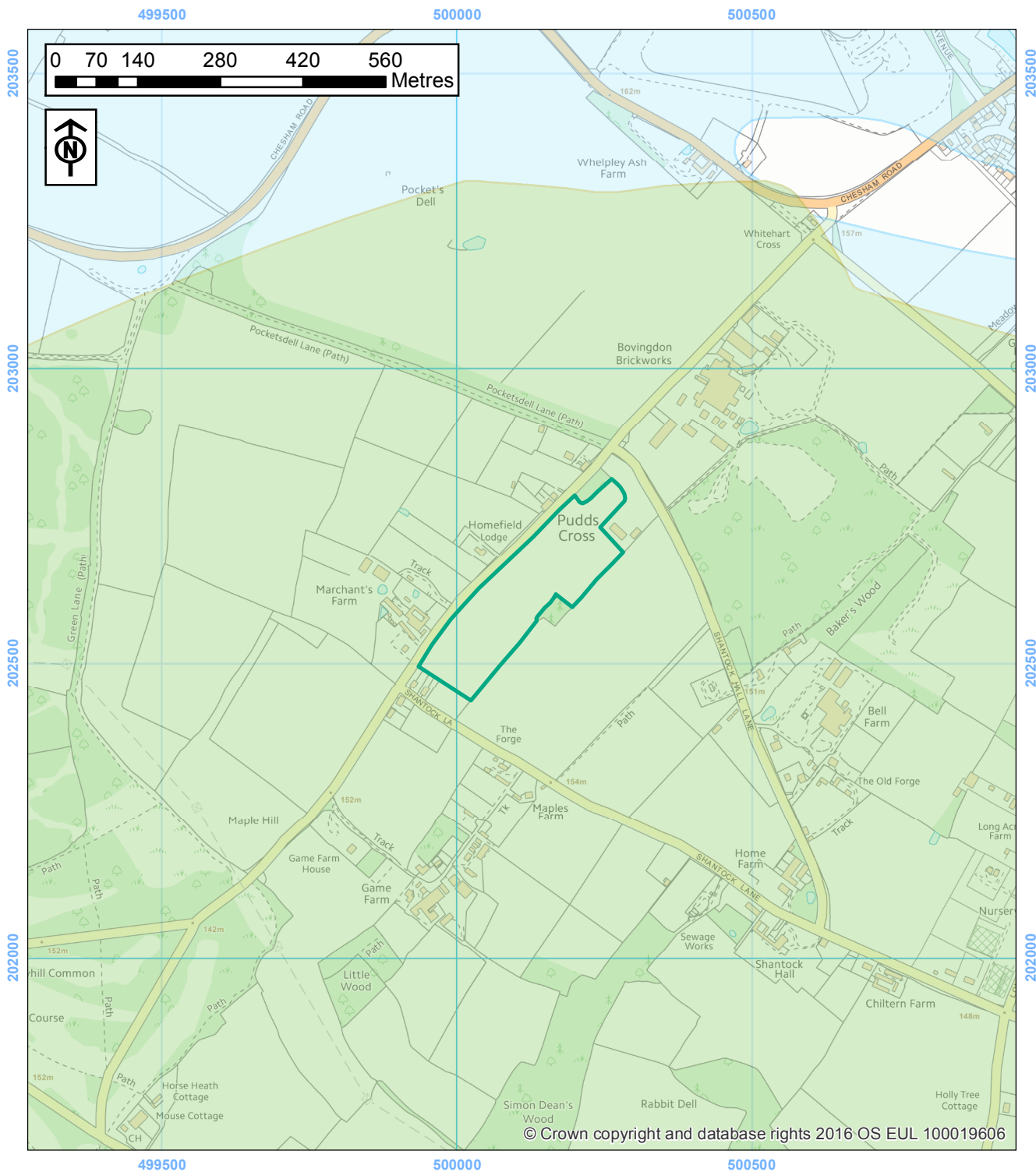
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

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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 13a - MLPCS013: Harry's Field**




## **KEY**

-  Omitted Site
-  Main Rivers
-  Historic Flood Map
-  Lake, Inland Water or Reservoir
-  Flood Warning Areas

## **Flood Zones**

-  Flood Zone 3
-  Flood Zone 2

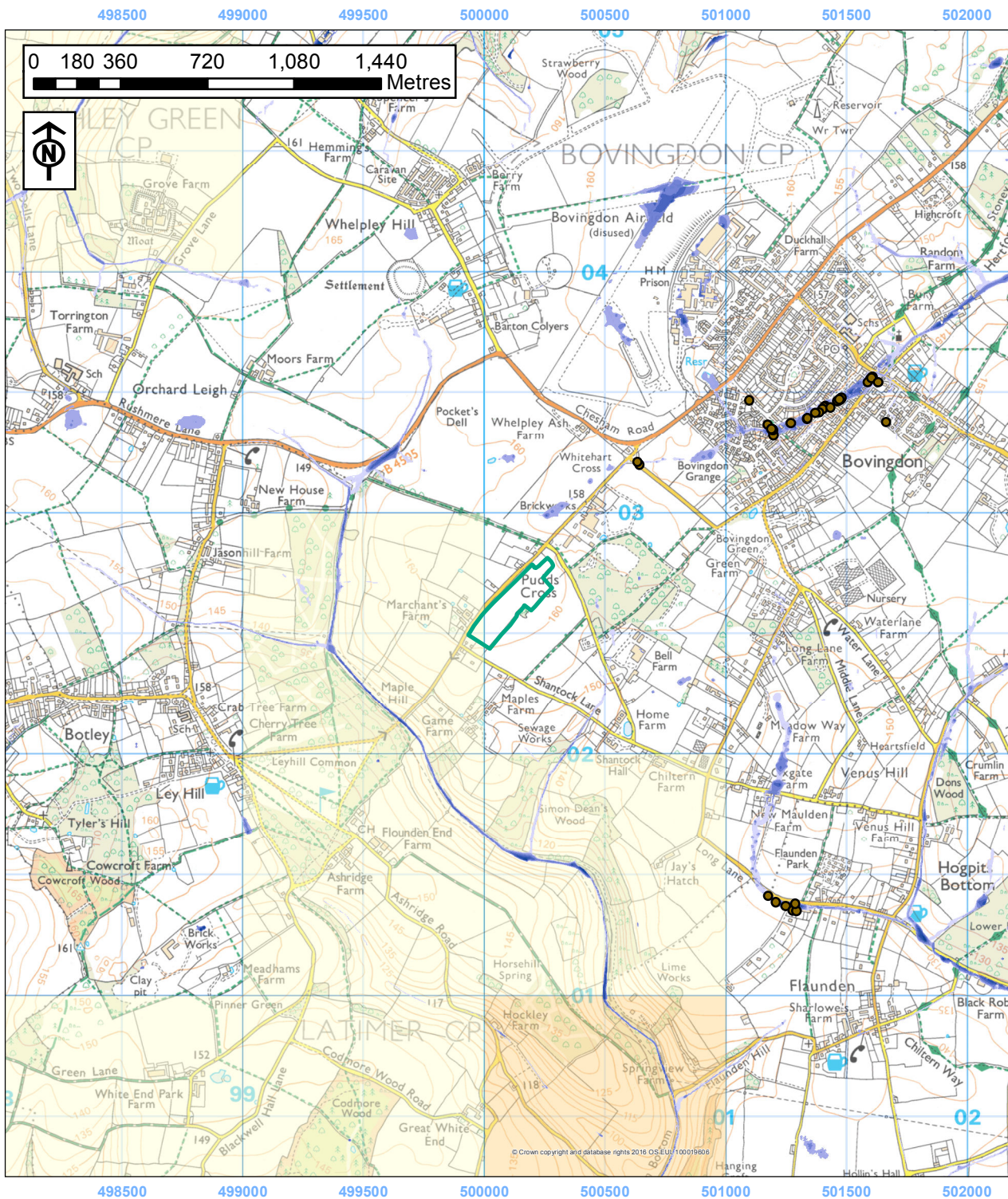
## **Groundwater Source Protection Zone**

-  Zone I - Inner Protection Zone
-  Zone II - Outer Protection Zone
-  Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018

## Map 13b - MLPCS013: Harry's Field

### KEY

Omitted Site

### Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

#### Flooding

#### Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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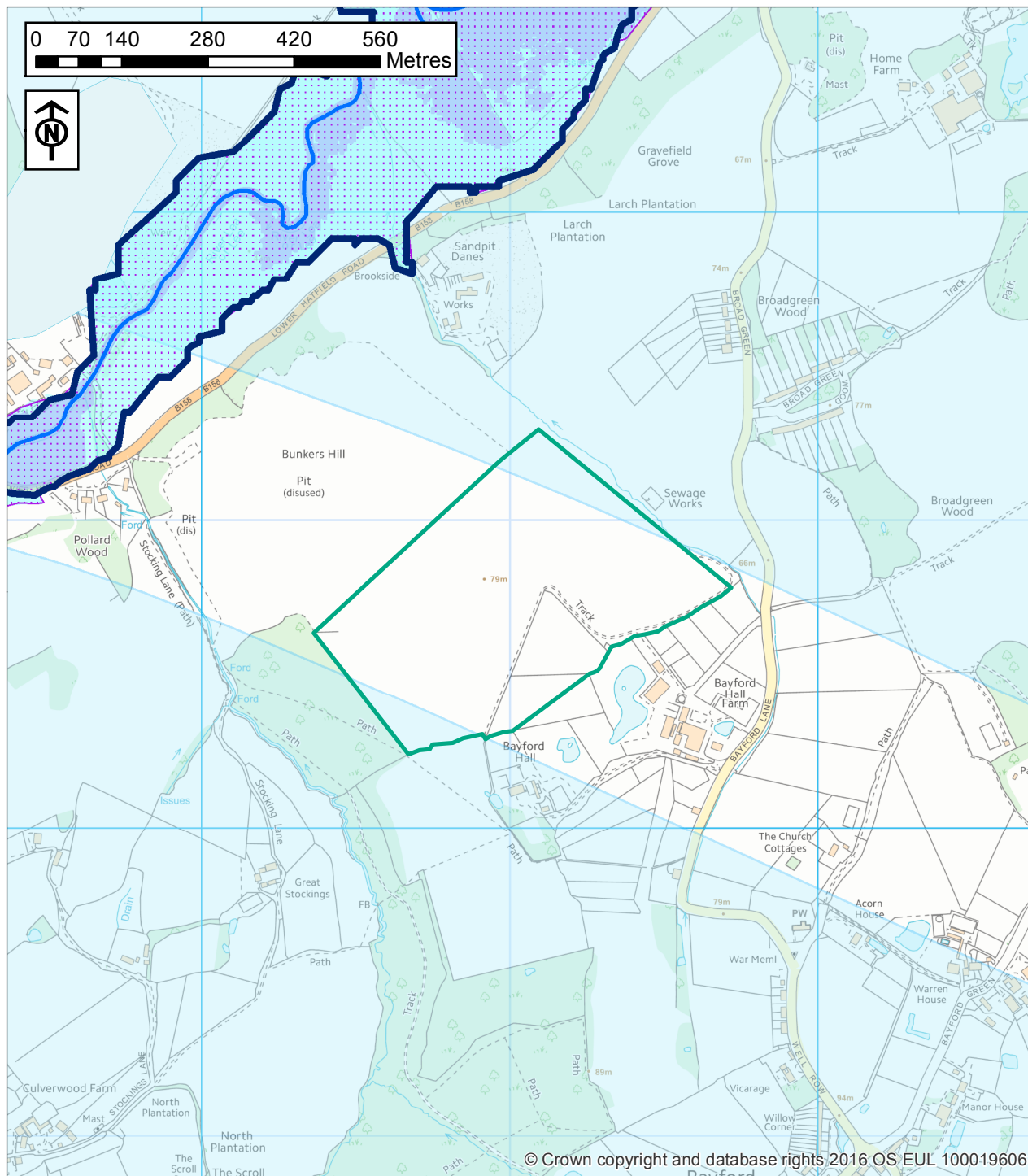
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Updated Addendum to the Level 1 SFRA, December 2018

## Map 14a - MLPCS014: Waterhall Bunkers Hill South

### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

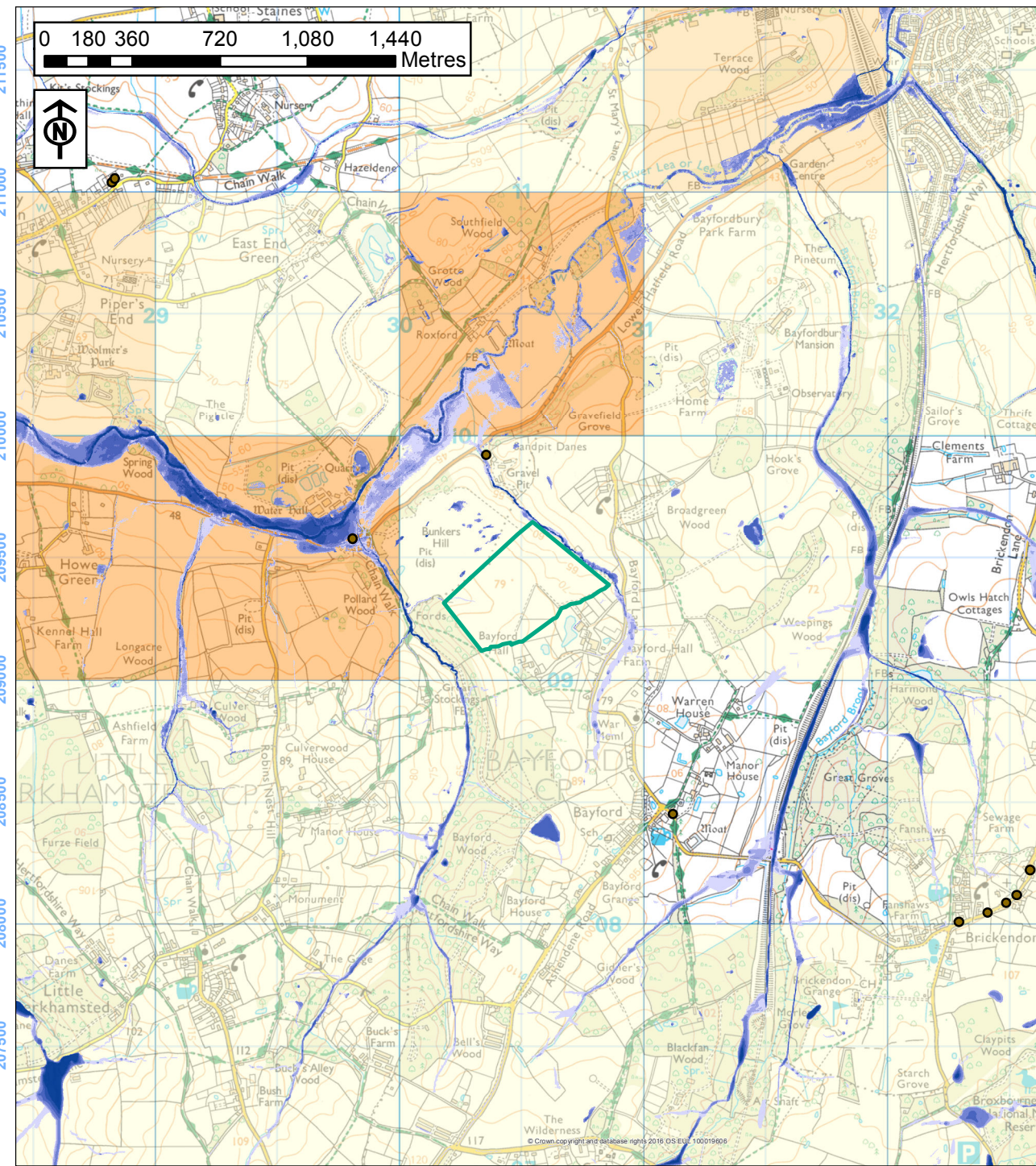
Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018

## Map 14b - MLPCS014: Waterhall Bunkers Hill South

### KEY

Omitted Site

### Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

#### Flooding

#### Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000

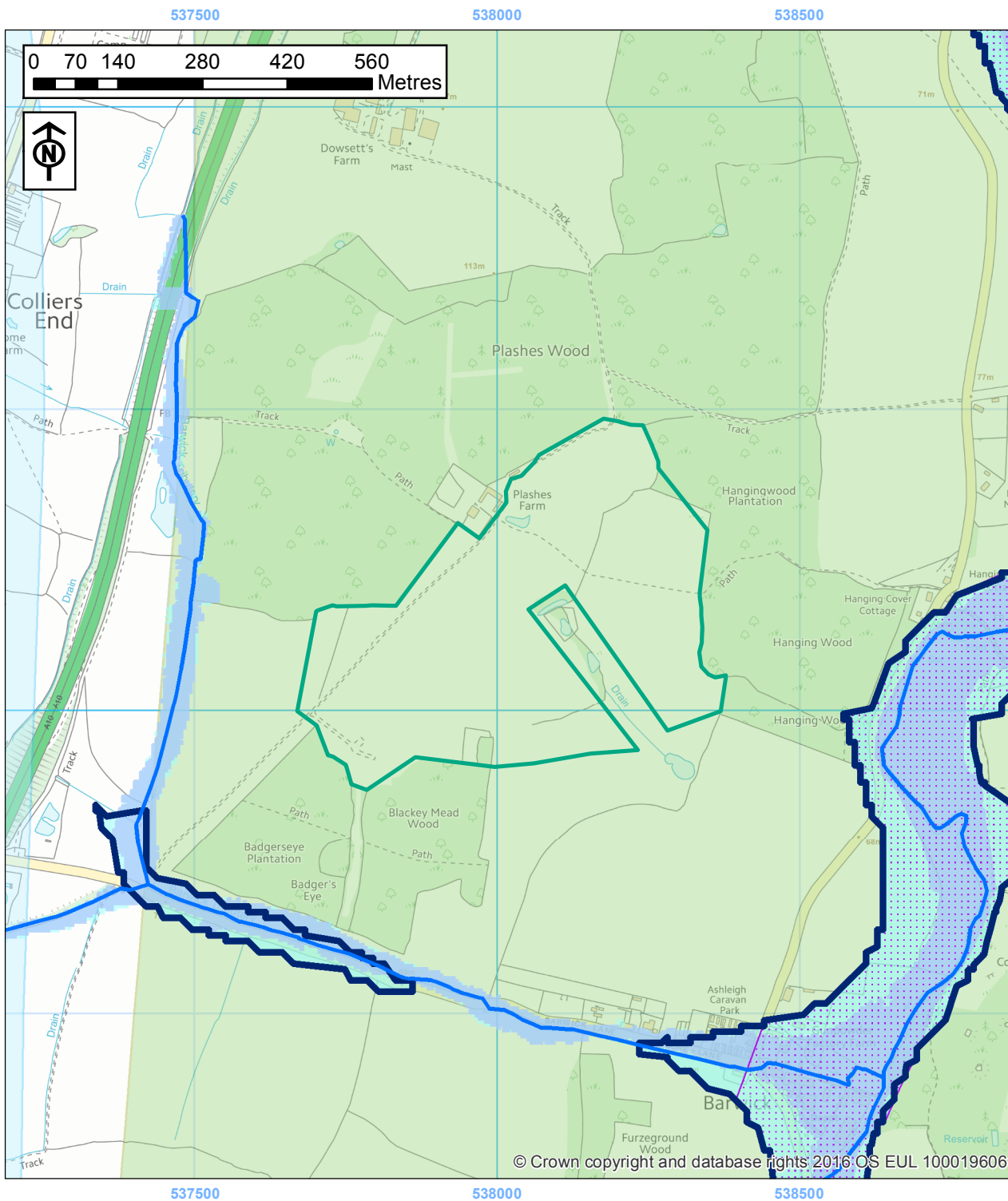


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

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# Updated Addendum to the Level 1 SFRA, December 2018 Map 15a - MLPCS015: Plashes Farm




### **KEY**

-  Omitted Site
-  Main Rivers
-  Historic Flood Map
-  Lake, Inland Water or Reservoir
-  Flood Warning Areas

### Flood Zones

-  Flood Zone 3
-  Flood Zone 2

### Groundwater Source Protection Zone

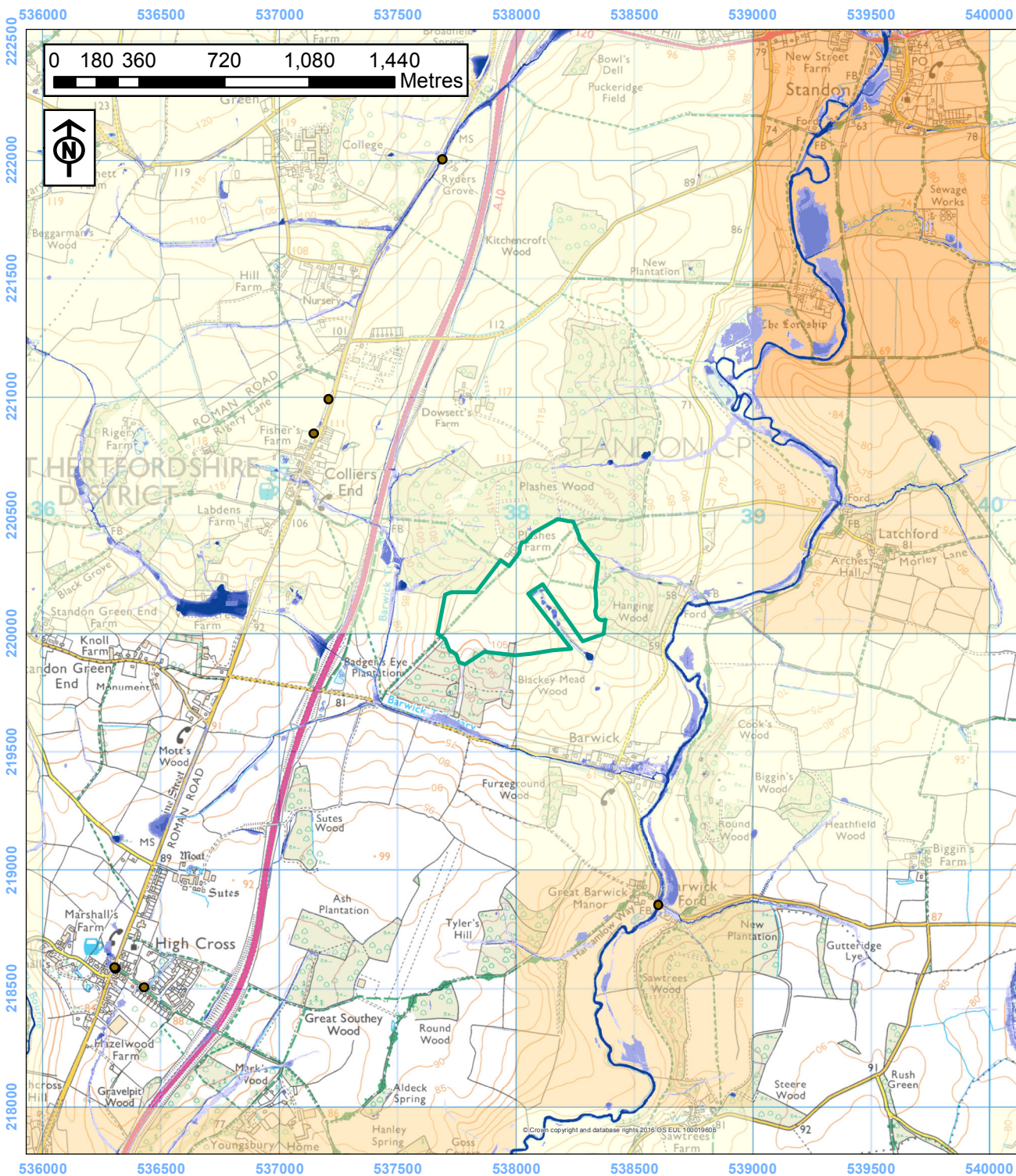
-  Zone I - Inner Protection Zone
-  Zone II - Outer Protection Zone
-  Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018

## Map 15b - MLPCS015: Plashes Farm

### KEY

Omitted Site

### Groundwater Flood Risk

>= 75%  
 >= 50% < 75%  
 >= 25% < 50%  
 < 25%

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

#### Flooding

#### Depth (m)

0.00 - 0.15      0.60 - 0.90  
 0.15 - 0.30      0.90 - 1.20  
 0.30 - 0.60      > 1.20

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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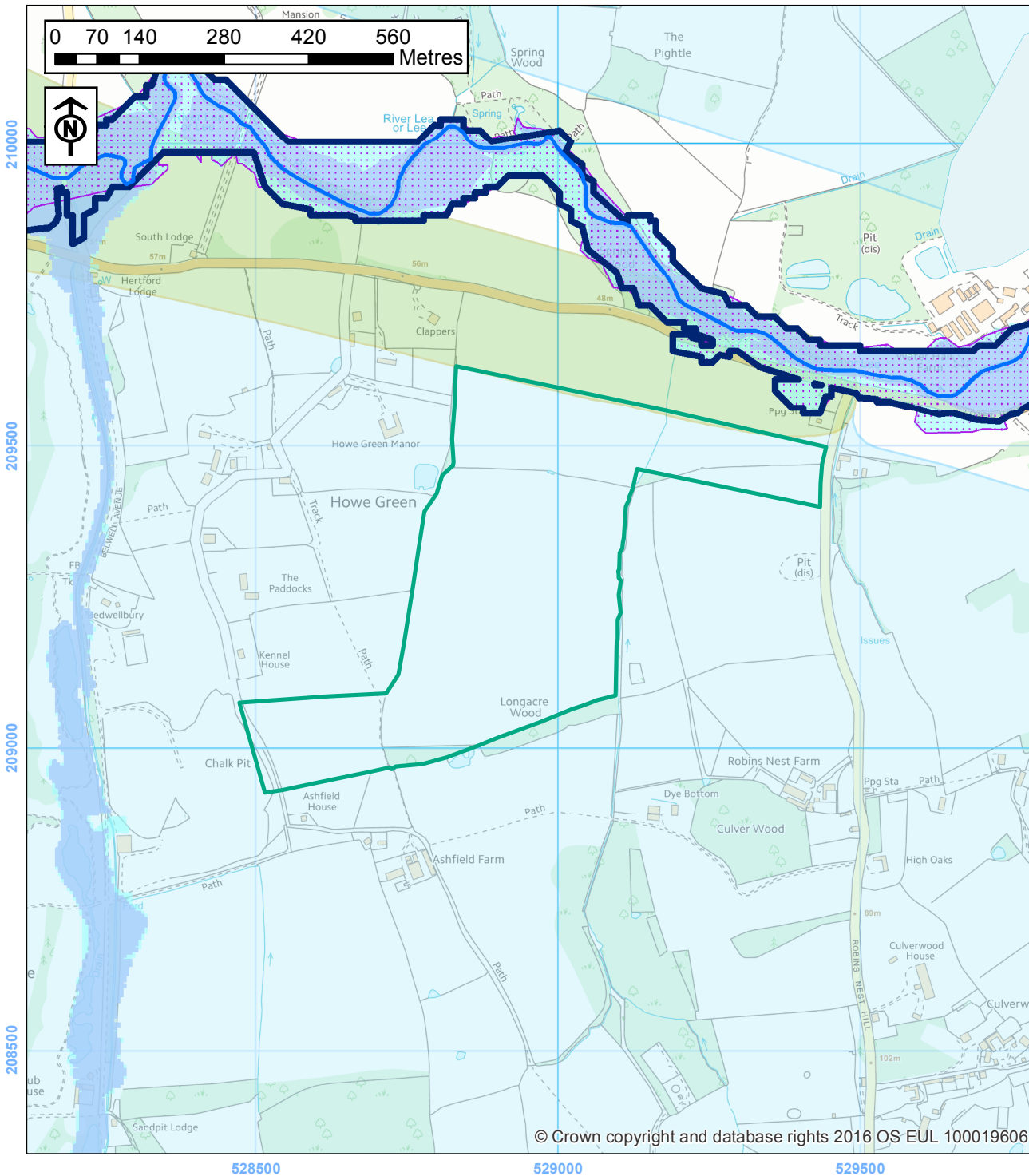
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 16a - MLPCS016: Waterhall Howe Green**



### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

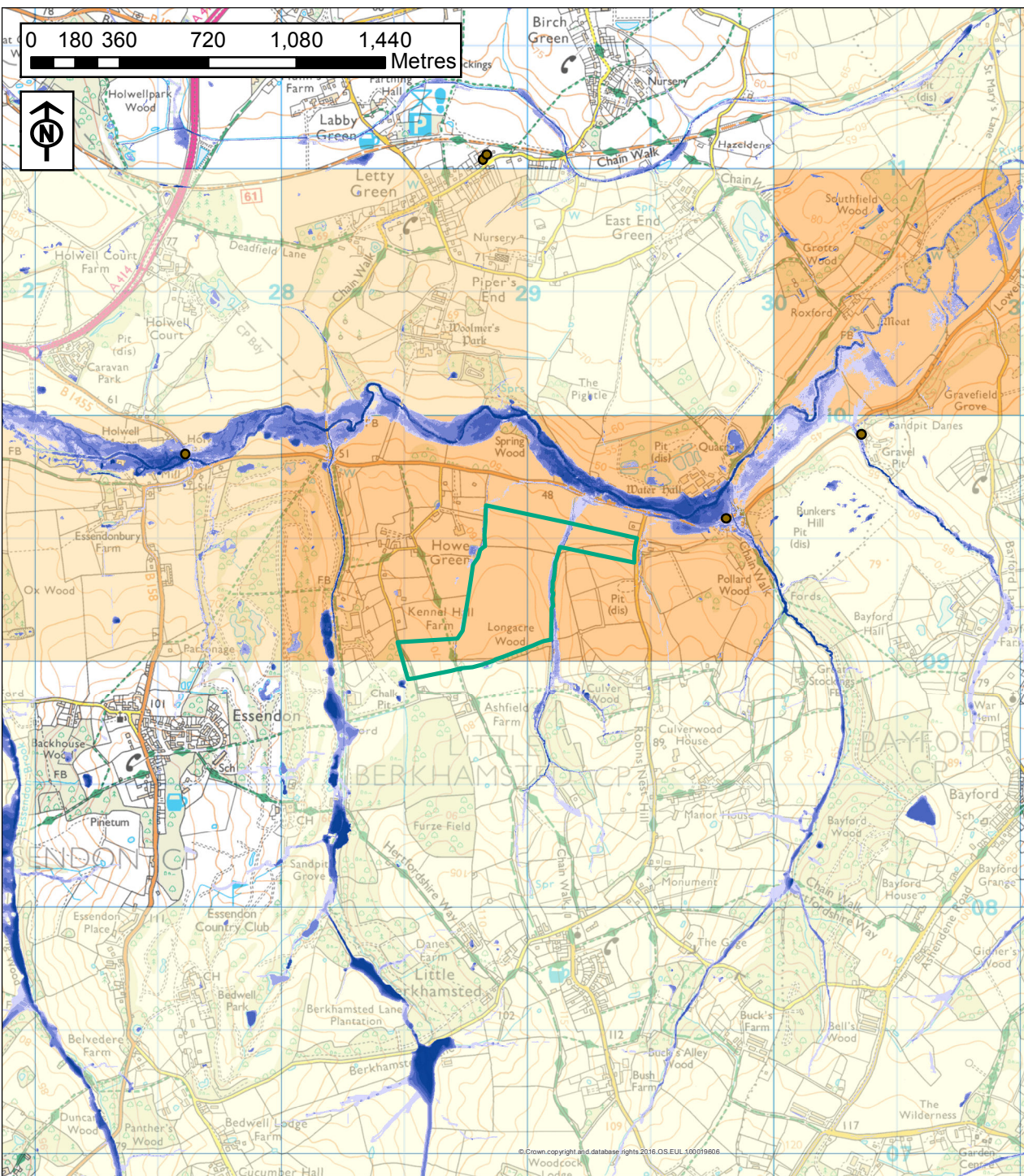
Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 16b - MLPCS016: Waterhall Howe Green**

## **KEY**

Omitted Site

## Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

## LLFA Flood Incident Record

Flood Incident Record\*

## Surface Water

## Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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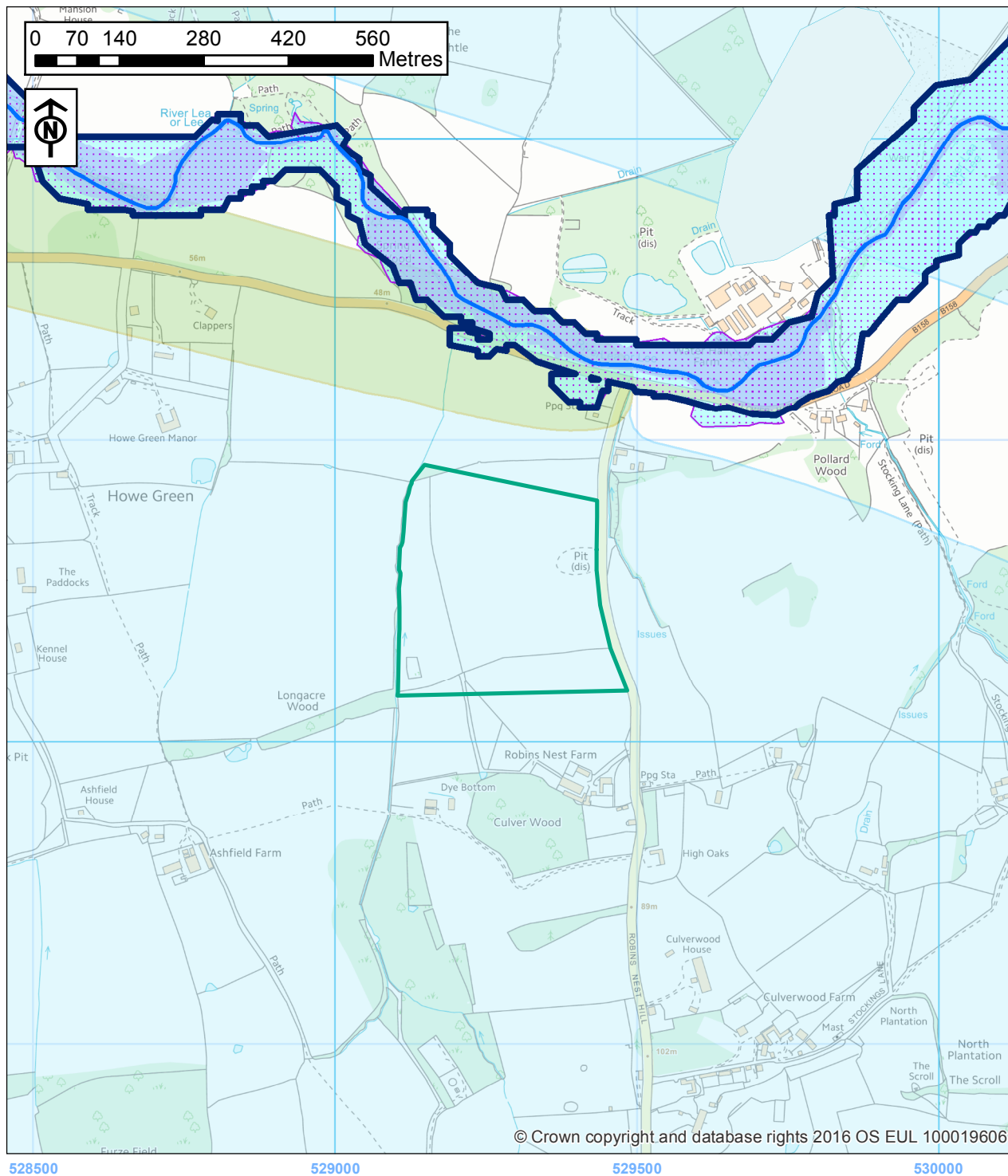


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## Updated Addendum to the Level 1 SFRA, December 2018 Map 17a - MLPCS017: Robins Nest Hill

### KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### Flood Zones

- Flood Zone 3
- Flood Zone 2

### Groundwater Source Protection Zone

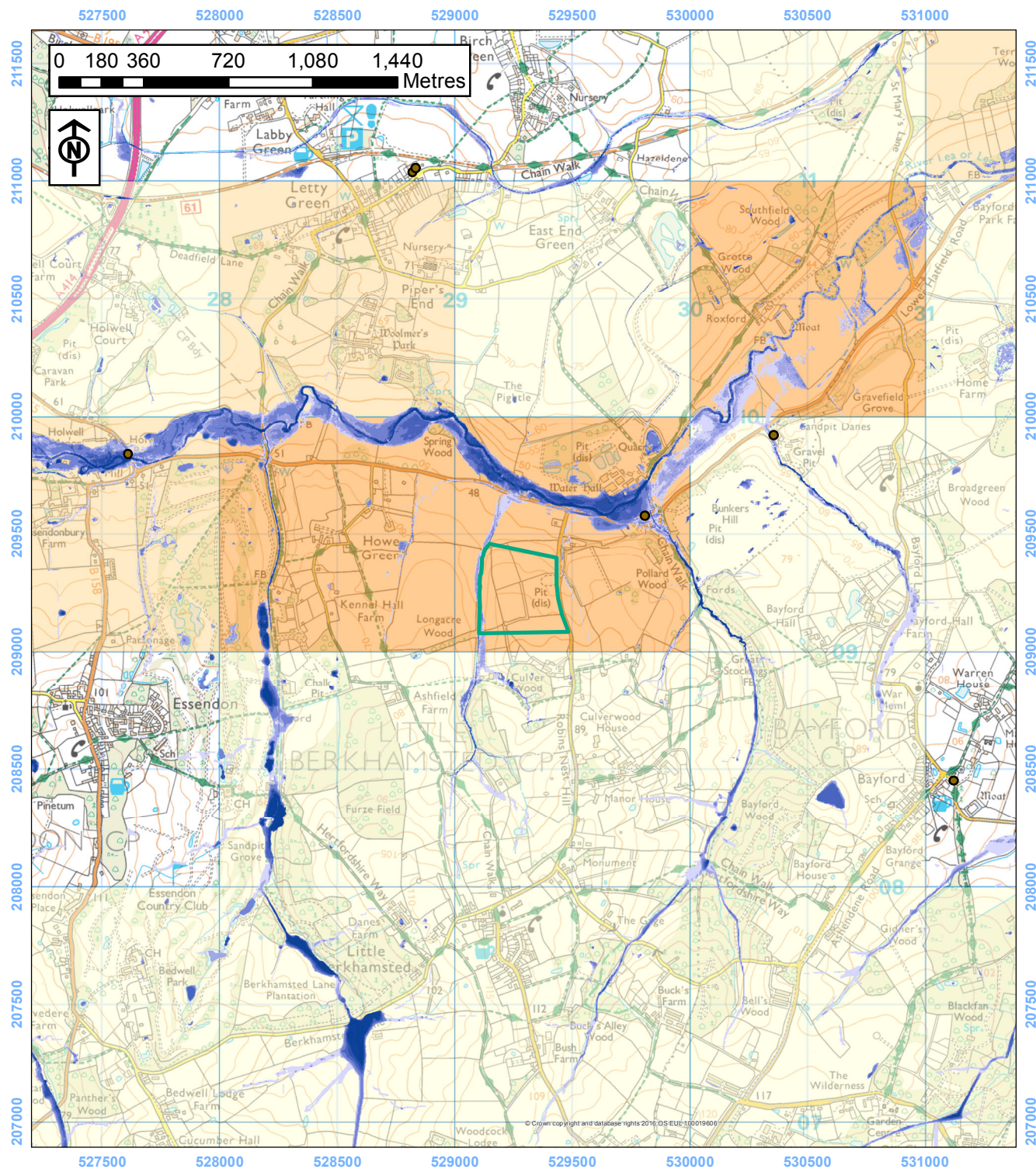
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 17b - MLPCS017: Robins Nest Hill**

**KEY**

Omitted Site

Groundwater Flood Risk

>= 75%  
 >= 50% < 75%  
 >= 25% < 50%  
 < 25%

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	> 1.20

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



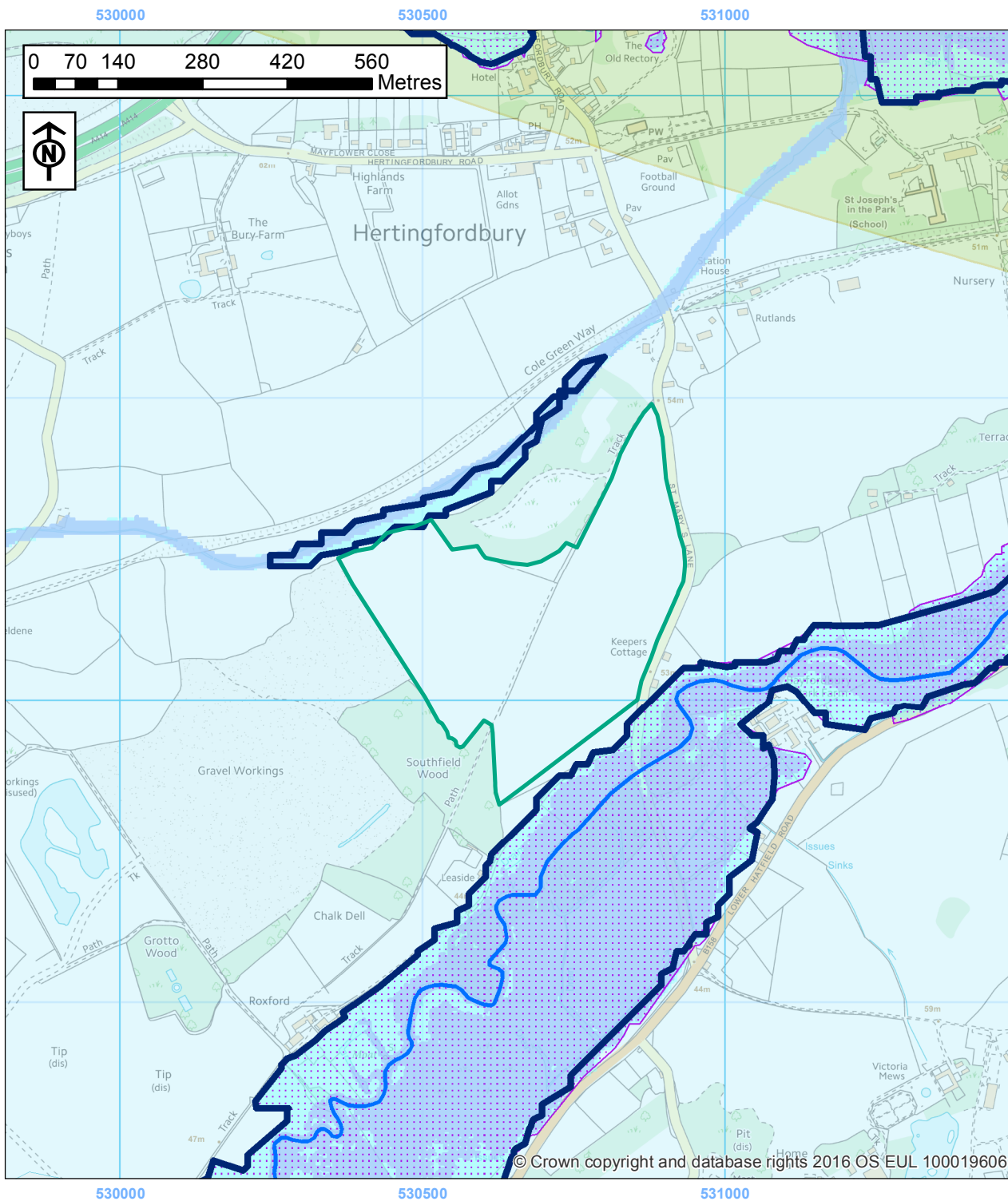
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# Updated Addendum to the Level 1 SFRA, December 2018 Map 18a - MLPCS018: Southfield Wood East

## KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

## Flood Zones

- Flood Zone 3
- Flood Zone 2

## Groundwater Source Protection Zone

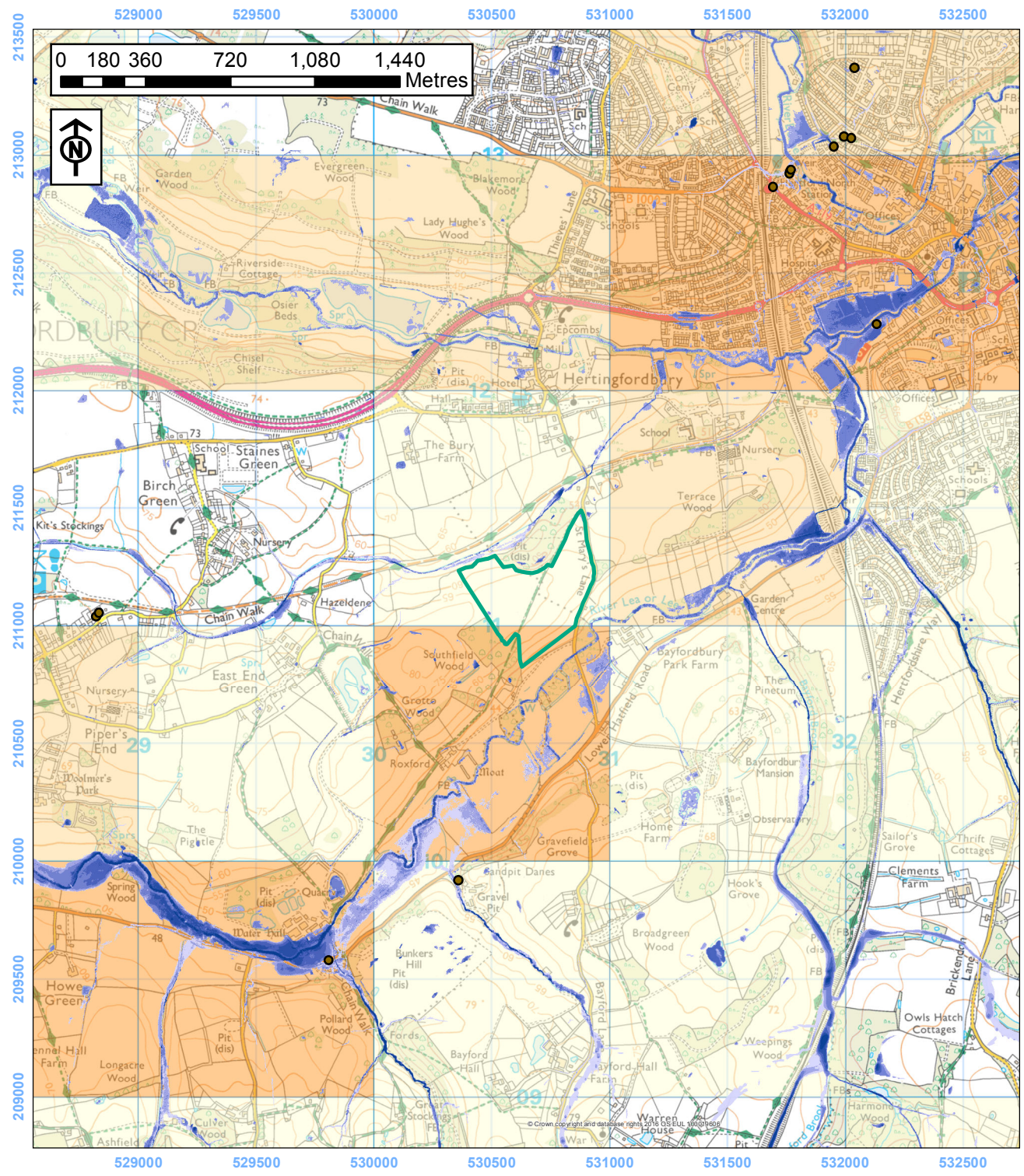
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 18b - MLPCS018: Southfield Wood East**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$   
  $\geq 50\% < 75\%$   
  $\geq 25\% < 50\%$   
  $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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Updated Addendum to the Level 1 SFRA, December 2018

## Map 19a - MLPCS019: Pipers End

### KEY

Omitted Site

Main Rivers

Historic Flood Map

Lake, Inland Water or Reservoir

Flood Warning Areas

### Flood Zones

Flood Zone 3

Flood Zone 2

### Groundwater Source Protection Zone

Zone I - Inner Protection Zone

Zone II - Outer Protection Zone

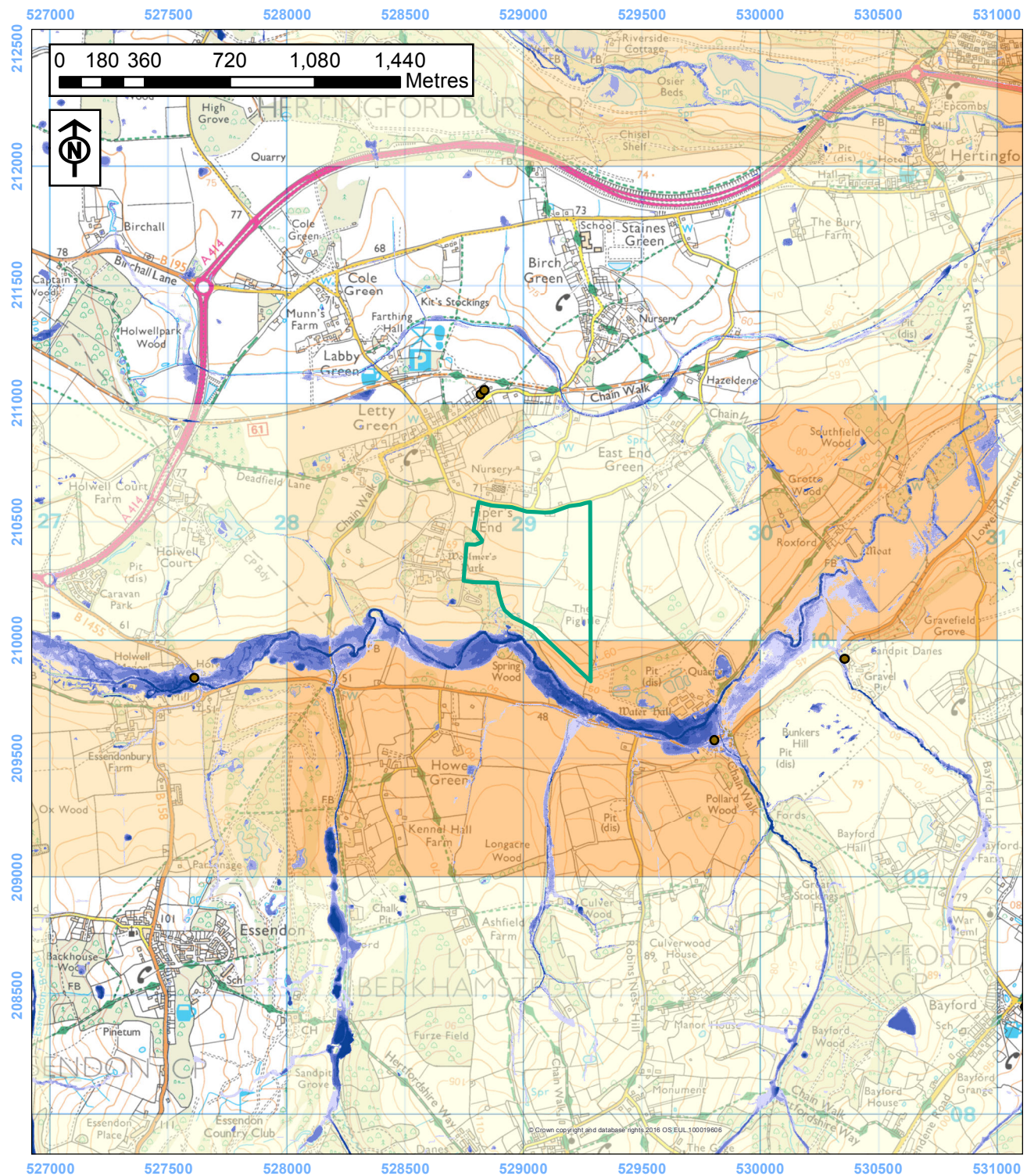
Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 19b - MLPCS019: Pipers End**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$   
  $\geq 50\% < 75\%$   
  $\geq 25\% < 50\%$   
  $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000

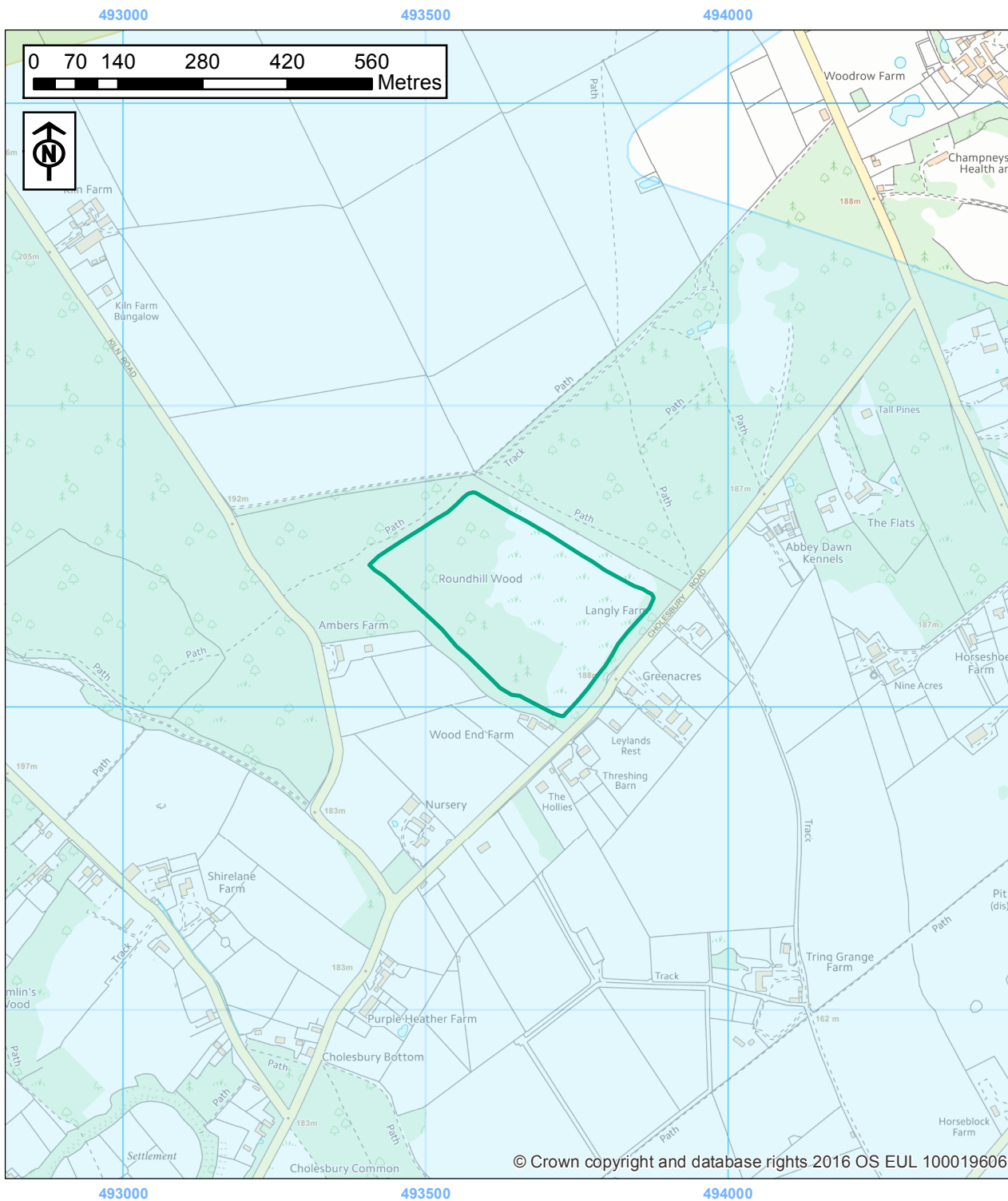


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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 20a - MLPCS020: Roundhill Wood**




**KEY**

-  Omitted Site
-  Main Rivers
-  Historic Flood Map
-  Lake, Inland Water or Reservoir
-  Flood Warning Areas

**Flood Zones**

-  Flood Zone 3
-  Flood Zone 2

**Groundwater Source Protection Zone**

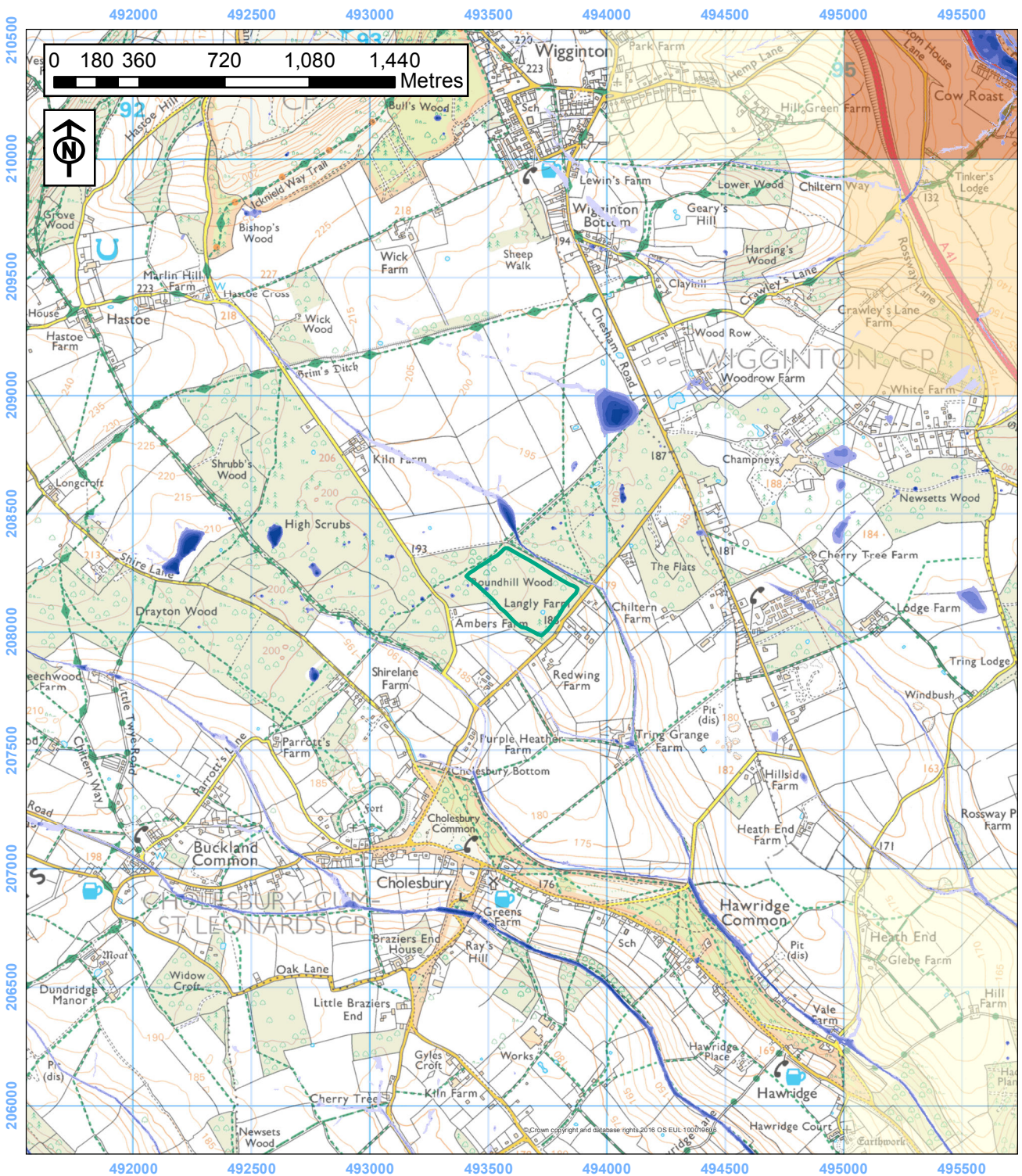
-  Zone I - Inner Protection Zone
-  Zone II - Outer Protection Zone
-  Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 20b - MLPCS020: Roundhill Wood**

## **KEY**

Omitted Site

## Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

## LLFA Flood Incident Record

Flood Incident Record\*

## Surface Water

## Flooding

## Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



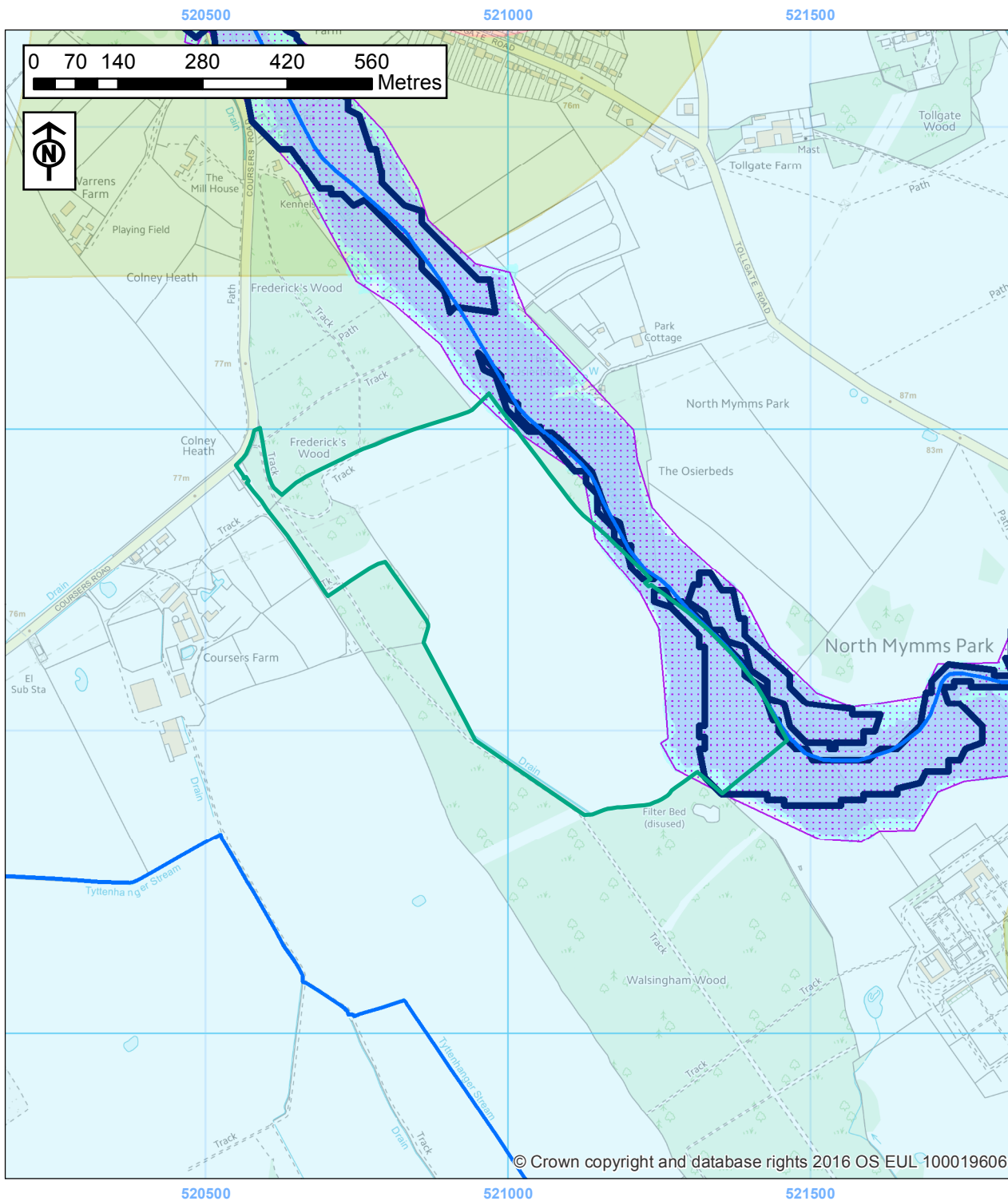
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# Updated Addendum to the Level 1 SFRA, December 2018 Map 21a - MLPCS021: North Mymms (West)

### **KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

### **Flood Zones**

- Flood Zone 3
- Flood Zone 2

### **Groundwater Source Protection Zone**

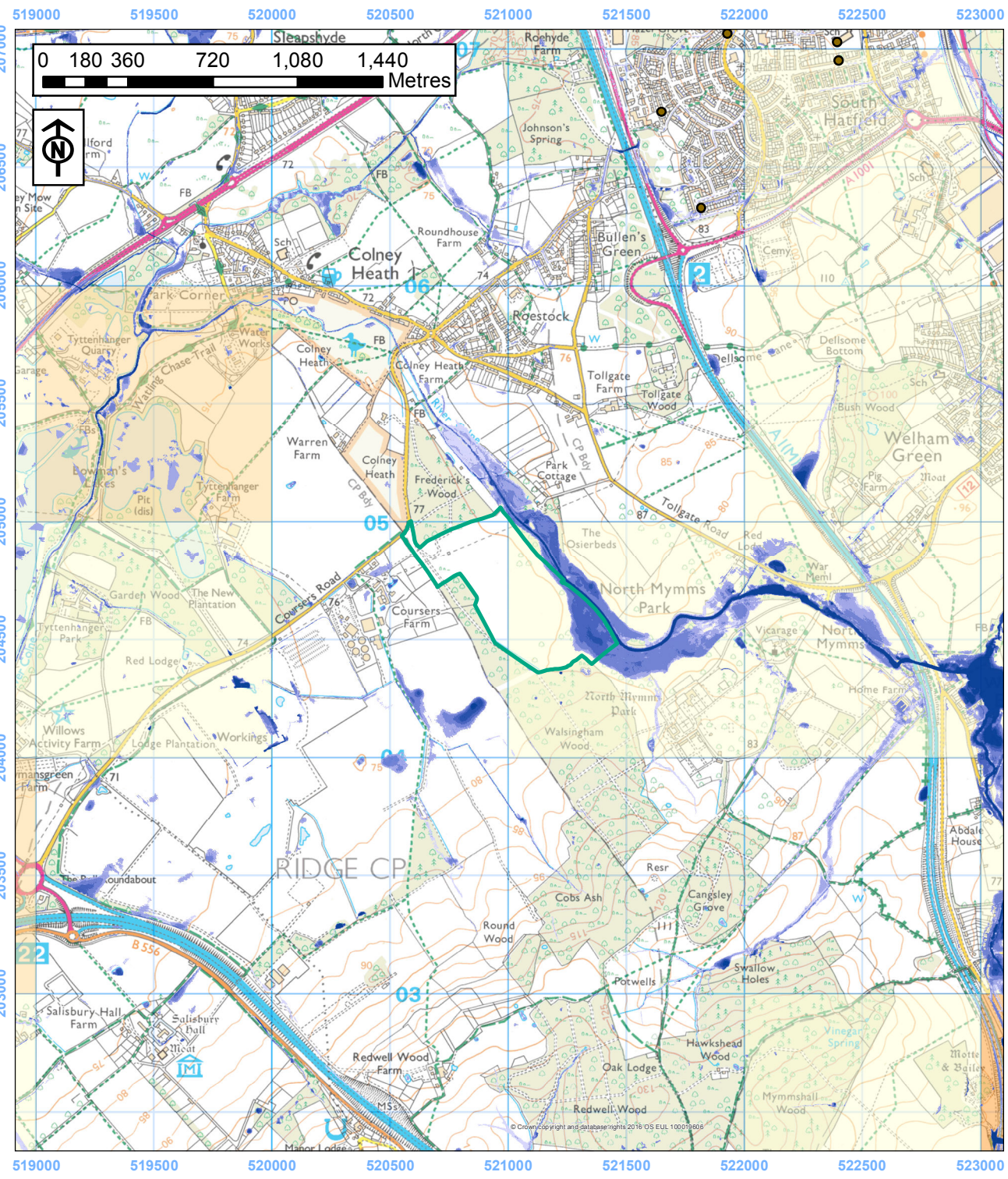
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 21b - MLPCS021: North Mymms (West)**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$

$\geq 50\% < 75\%$

$\geq 25\% < 50\%$

$< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15

0.15 - 0.30

0.30 - 0.60

0.60 - 0.90

0.90 - 1.20

$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



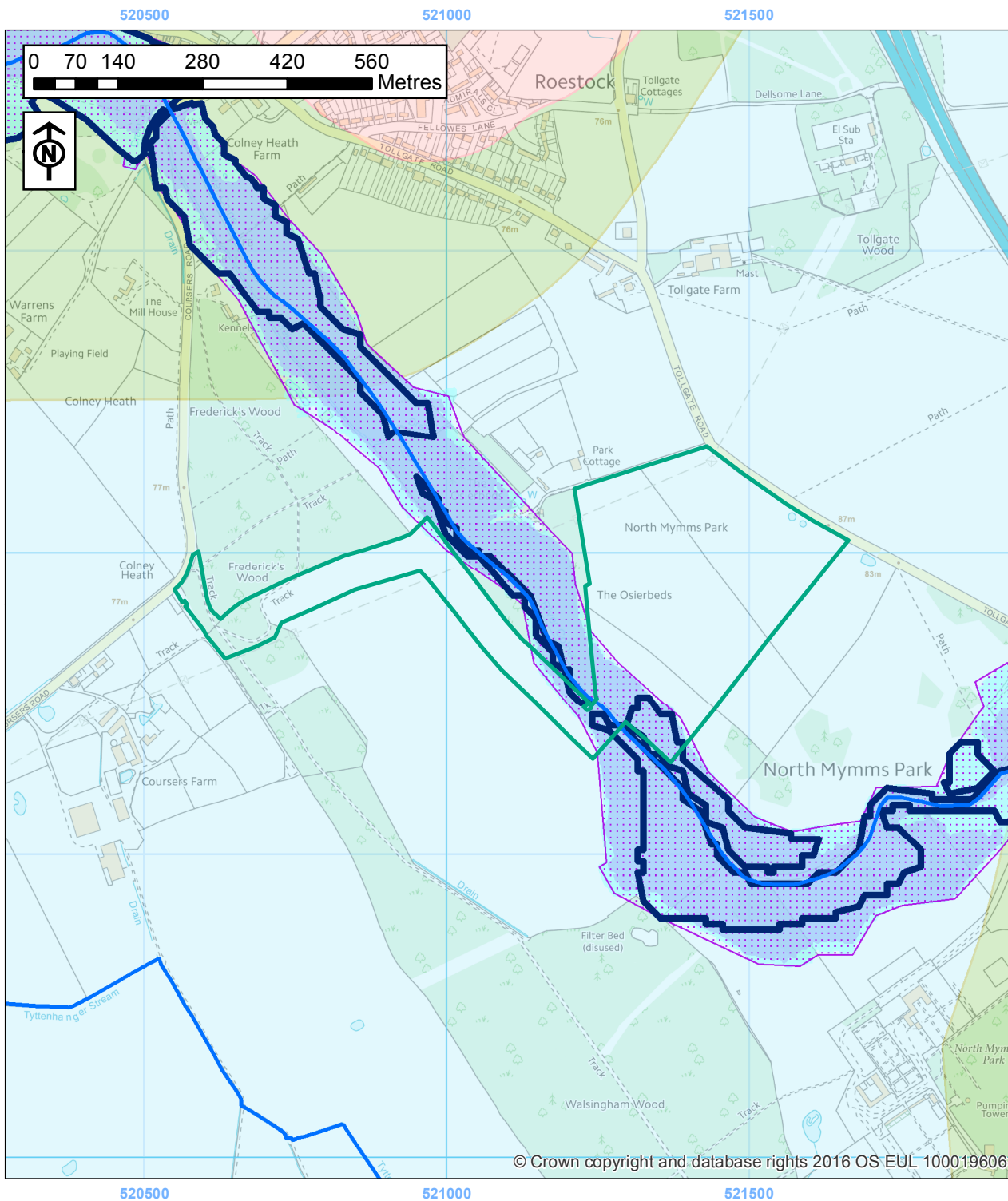
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 22a - MLPCS022: North Mymms (East)**

**KEY**

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

**Flood Zones**

- Flood Zone 3
- Flood Zone 2

**Groundwater Source Protection Zone**

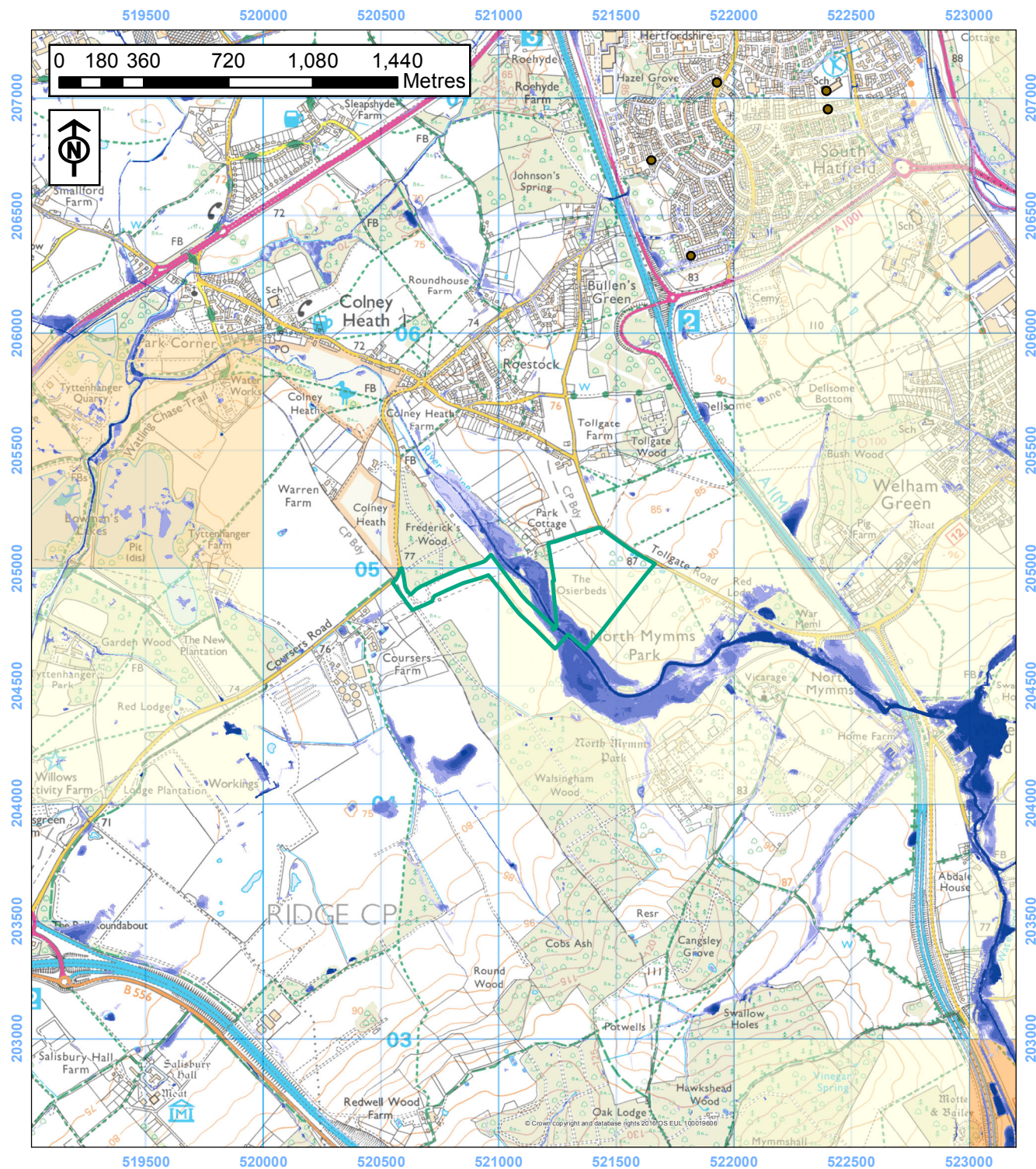
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 22b - MLPCS022: North Mymms (East)**

**KEY**

Omitted Site

Groundwater Flood Risk

$\geq 75\%$   
 $\geq 50\% < 75\%$   
 $\geq 25\% < 50\%$   
 $< 25\%$

LLFA Flood Incident Record

Flood Incident Record\*

Surface Water

Flooding

Depth (m)

0.00 - 0.15	0.60 - 0.90
0.15 - 0.30	0.90 - 1.20
0.30 - 0.60	$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



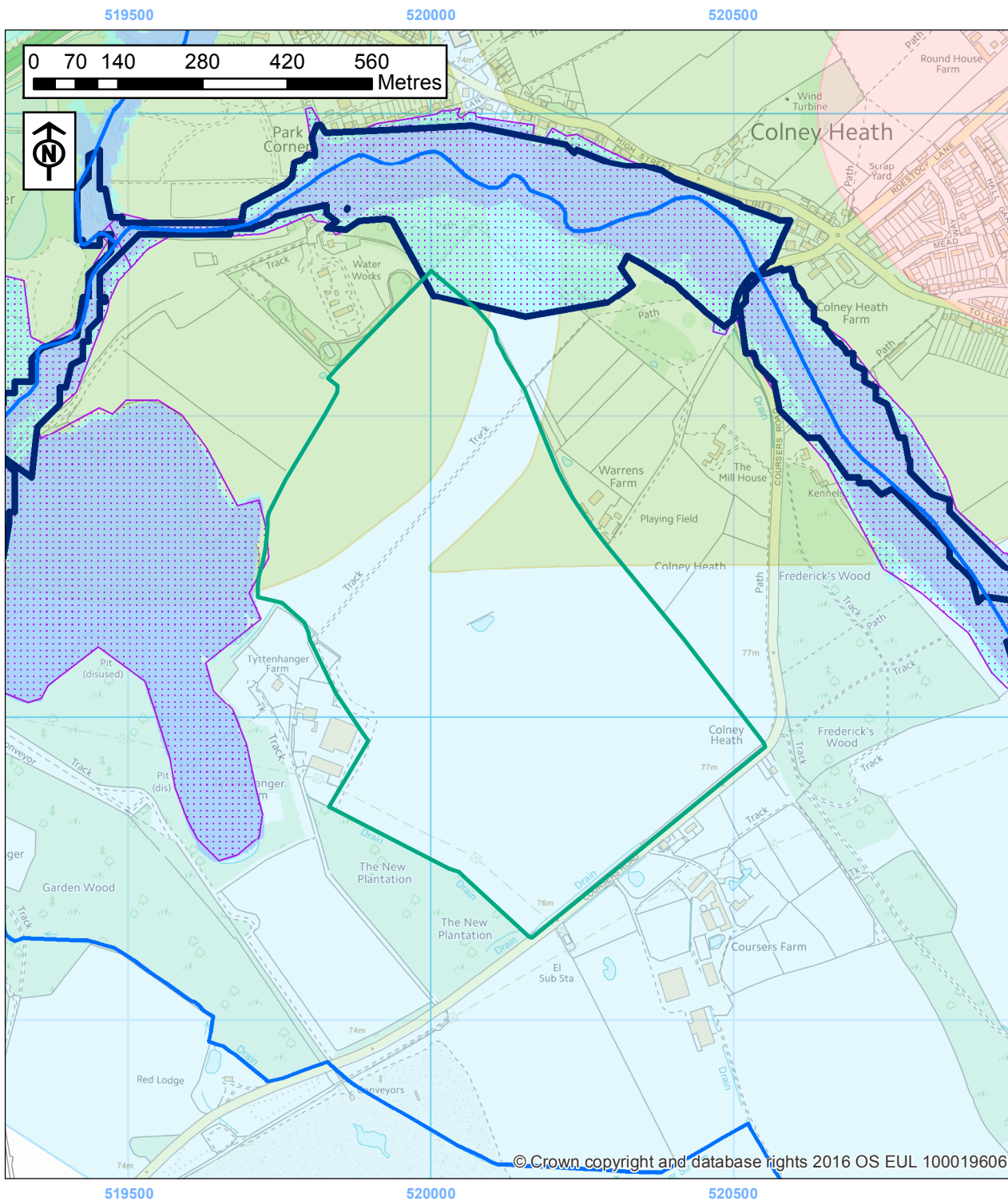
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# Updated Addendum to the Level 1 SFRA, December 2018 Map 23a - MLPCS023: Warren Farm

## KEY

- Omitted Site
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

## Flood Zones

- Flood Zone 3
- Flood Zone 2

## Groundwater Source Protection Zone

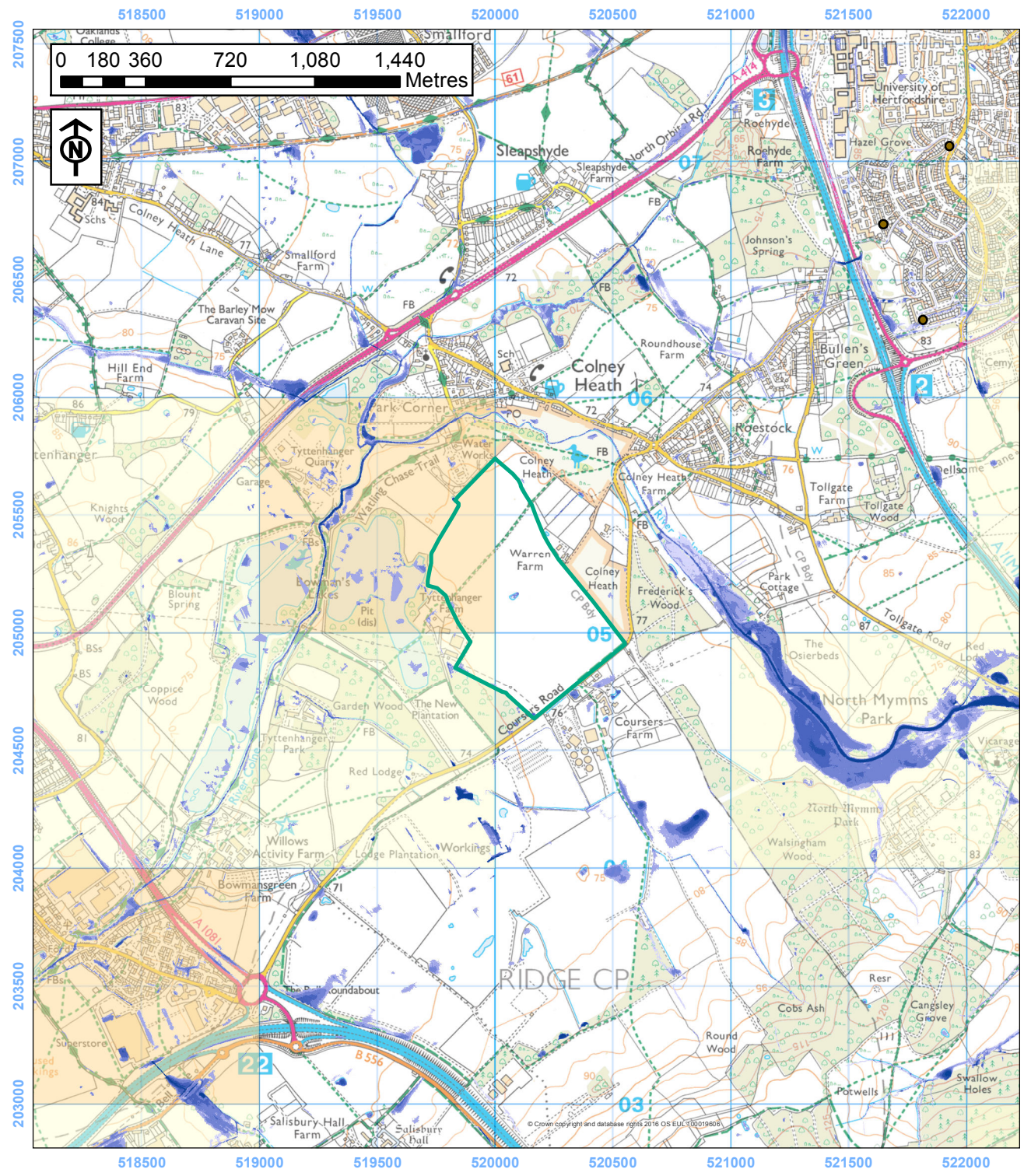
- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Scale: 1:10,000



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# Updated Addendum to the Level 1 SFRA, December 2018

## Map 23b - MLPCS023: Warren Farm

### KEY

 Omitted Site

### Groundwater Flood Risk

-   $\geq 75\%$
-   $\geq 50\% < 75\%$
-   $\geq 25\% < 50\%$
-   $< 25\%$







### LLFA Flood Incident Record

-  Flood Incident Record\*

### Surface Water

#### Flooding

#### Depth (m)

- |   |   |
|---|---|
|  0.00 - 0.15 |  0.60 - 0.90 |
|  0.15 - 0.30 |  0.90 - 1.20 |
|  0.30 - 0.60 |  $> 1.20$    |

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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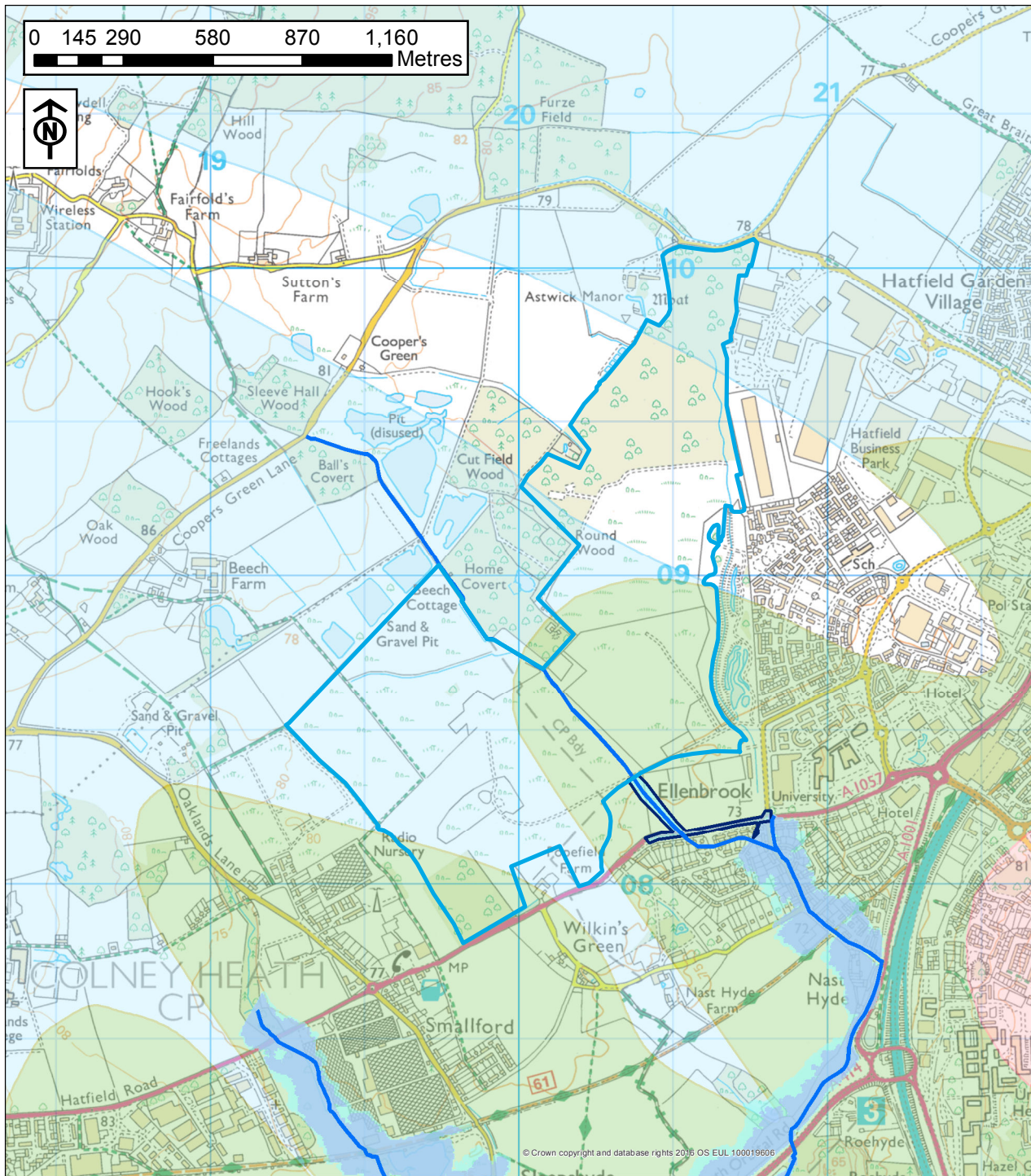
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518500 519000 519500 520000 520500 521000 521500

0 145 290 580 870 1,160 Metres



# Updated Addendum to the Level 1 SFRA, December 2018 Map 24a - (Adopted) PA1: Former BAe Site

## **KEY**

- Omitted Preferred Area
- Main Rivers
- Historic Flood Map
- Lake, Inland Water or Reservoir
- Flood Warning Areas

## **Flood Zones**

- Flood Zone 3
- Flood Zone 2

## **Groundwater Source Protection Zone**

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

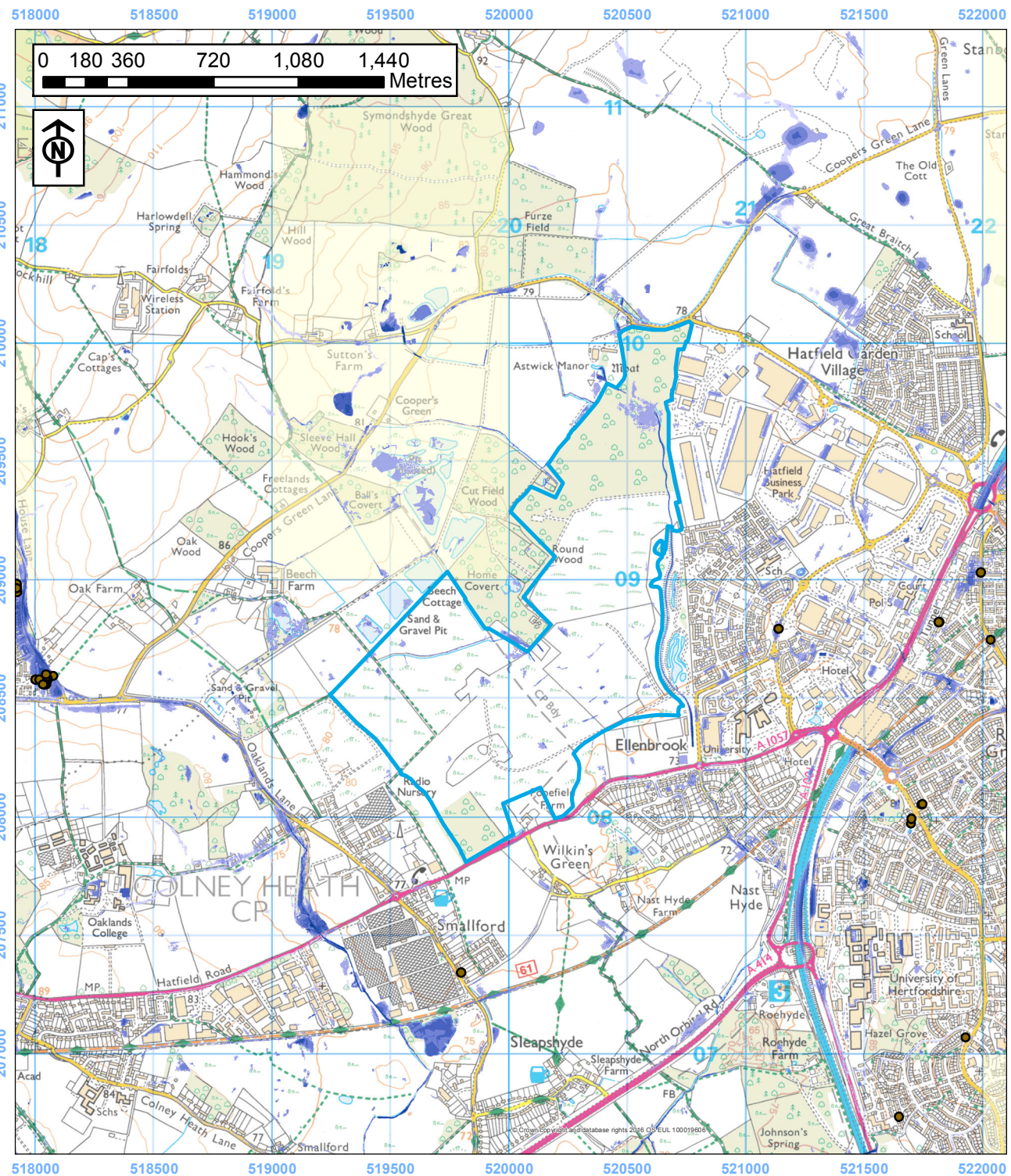
Scale: 1:20,000



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518500 519000 519500 520000 520500 521000 521500









Updated Addendum to the Level 1 SFRA, December 2018  
**Map 24b - (Adopted) PA1: Former BAe Site**

**KEY**

 Omitted Preferred Area

Groundwater Flood Risk







  $\geq 75\%$   
  $\geq 50\% < 75\%$   
  $\geq 25\% < 50\%$   
  $< 25\%$

LLFA Flood Incident Record

 Flood Incident Record\*

Surface Water Flooding

Depth (m)

 0.00 - 0.15	 0.60 - 0.90
 0.15 - 0.30	 0.90 - 1.20
 0.30 - 0.60	 $> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



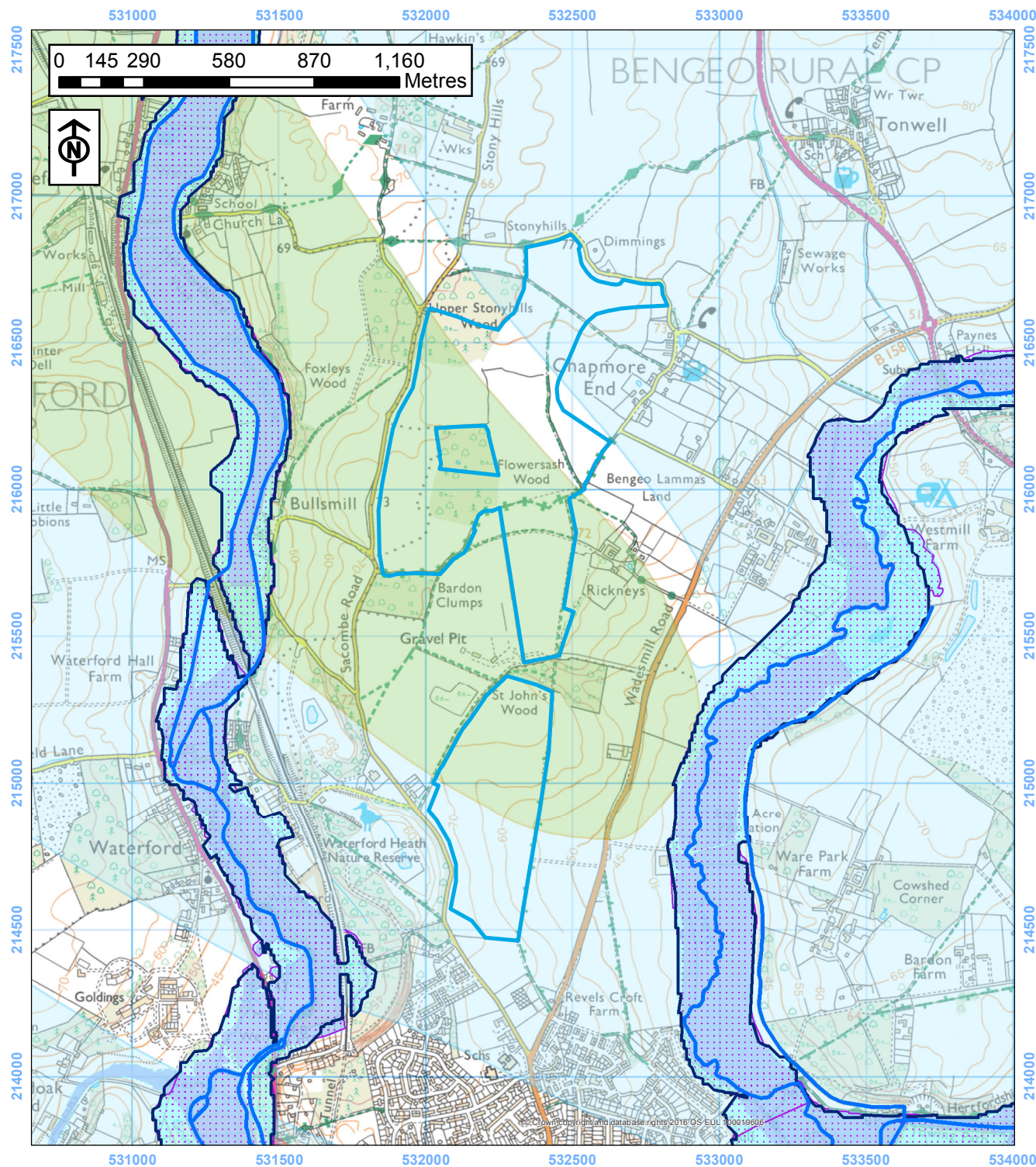
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Updated Addendum to the Level 1 SFRA, December 2018  
**Map 25a - (Adopted) PA2: Land adjoining Rickneys Quarry**




**KEY**

-  Omitted Preferred Area
-  Main Rivers
-  Historic Flood Map
-  Lake, Inland Water or Reservoir
-  Flood Warning Areas

**Flood Zones**

-  Flood Zone 3
-  Flood Zone 2

**Groundwater Source Protection Zone**

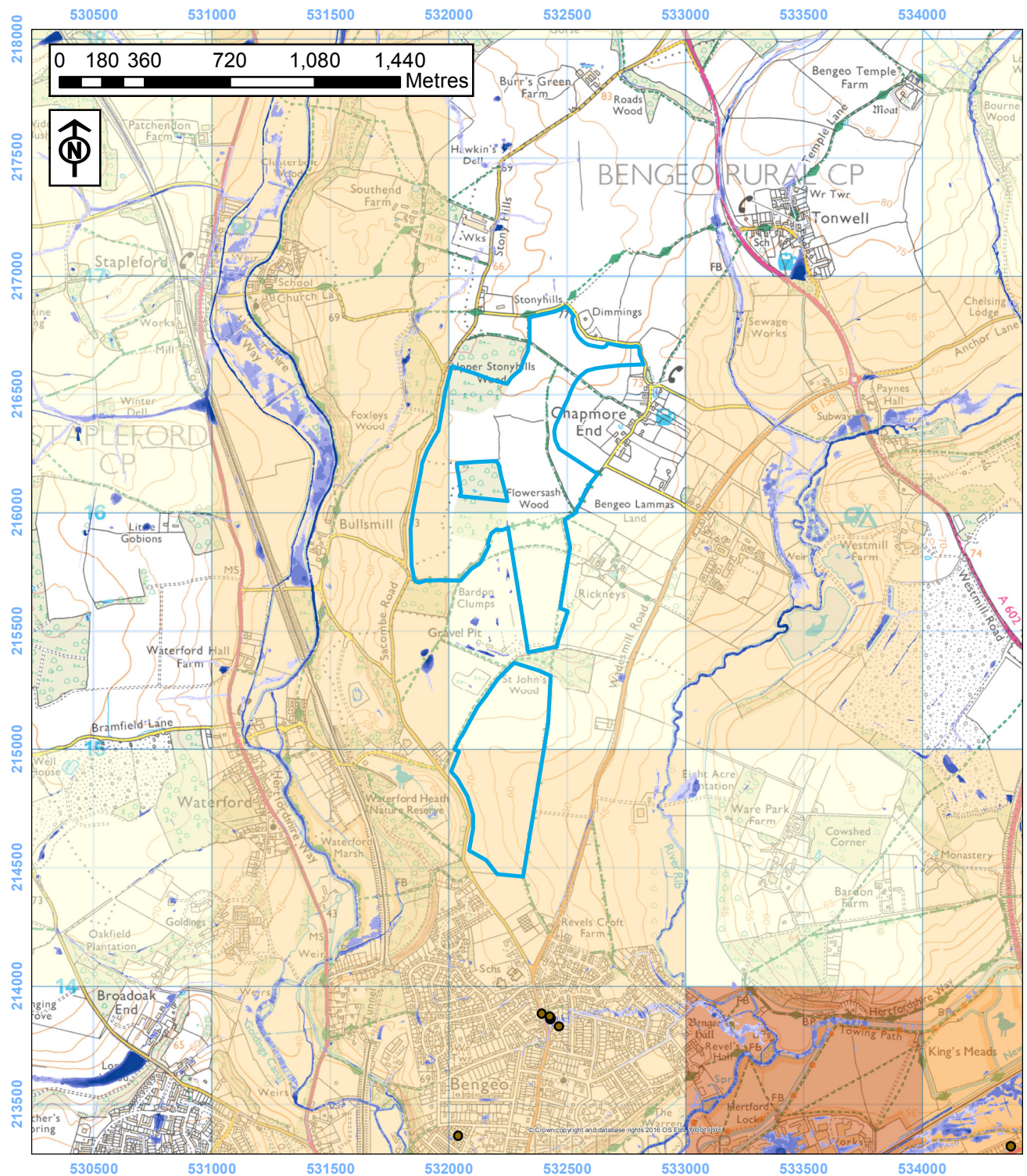
-  Zone I - Inner Protection Zone
-  Zone II - Outer Protection Zone
-  Zone III - Total Catchment

Scale: 1:20,000



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# Updated Addendum to the Level 1 SFRA, December 2018 **Map 25b - (Adopted) PA2: Land adjoining Rickneys Quarry**

### **KEY**

Omitted Preferred Area

### Groundwater Flood Risk

$\geq 75\%$

$\geq 50\% < 75\%$

$\geq 25\% < 50\%$

$< 25\%$

### LLFA Flood Incident Record

Flood Incident Record\*

### Surface Water

### Flooding

Depth (m)

0.00 - 0.15

0.15 - 0.30

0.30 - 0.60

0.60 - 0.90

0.90 - 1.20

$> 1.20$

\* Flood Incident Record provided by Lead Local Flood Authority. Point data indicates where flooding has been recorded in the vicinity of the site.

Scale: 1:25,000



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### **Appendix 3: Glossary of Terms**

Catchment Flood Management Plans (CFMPs): Are documents produced by the Environment Agency that cover each river catchment area in England and Wales and are designed to provide a strategic approach to flood risk management for the next 50-100 years.

Catchment Flood Management Plan Policy Units: Catchment areas that have been divided into individual policy units that relate to specific sections of a river. These identify the nature of flood risk and measures that need to be undertaken to reduce flood risk.

Flood Risk Management Strategies: Are documents produced by the Environment Agency that provide a strategic approach to flood risk management that recommend short, medium and long-term actions over the next 100 years.

Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. The Environment Agency has divided England into three zones; flood zones 1, 2 and 3. Definitions of these zones are contained in Section 5.

Groundwater Source Protection Zones show the risk of contamination from any activities that might cause pollution in the area. The Environment Agency has divided groundwater source catchments into three zones (inner, outer and total catchment). The inner zone (zone 1) is defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50m. The outer zone (zone 2) is defined by a 400 day travel time from a point below the water table. This zone has a minimum radius of 250 or 500m around the source, depending on the size of the abstraction. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

Main River is defined as a watercourse marked as such on a main river map, and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river.

Ordinary Watercourse includes every river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows and which does not form part of a main river.

River Basin Management Plans (RBMPs): Are documents produced by the Environment Agency that are drawn up for the 10 river basin districts in England and Wales, as a requirement of the EU Water Framework Directive. RBMPs are designed to protect and enhance the quality of fresh water, groundwater, estuaries and coastal water.

Surface Water Management Plans (SWMPs): Are plans which promote a coordinated strategic approach to managing surface water drainage and reducing



flood risk. They should reflect the future proposals of all key stakeholders and provide a clear delivery plan. They may also provide a way to integrate the requirements of forthcoming River Basin Management Plans into development planning. SWMPs should focus on managing flood risk and optimising the provision of SuDS.

## **Appendix 4: Sources of Information Used in the Updated Hertfordshire SFRA (2018)**

The Updated Level 1 SFRA for the review of the Hertfordshire Minerals Local Plan has drawn on a number of sources of information, all of which are listed below:

1. Strategic Flood Risk Assessment prepared for Broxbourne Borough Council published in May 2016. The SFRA covers the entire area that lies within the administrative boundary of Broxbourne.
2. Strategic Flood Risk Assessment prepared by East Herts Council and published in August 2016. The SFRA covers the entire area that lies within the administrative boundary of East Herts.
3. Strategic Flood Risk Assessment prepared for Hertsmere Borough Council by Halcrow Group Ltd and published in May 2008. The SFRA covers the entire area that lies within the administrative boundary of Hertsmere.
4. Strategic Flood Risk Assessment prepared for North Herts District Council published in September 2016. The SFRA covers the entire area that lies within the administrative boundary of North Herts.
5. Strategic Flood Risk Assessment prepared for Stevenage Borough Council published in June 2016. The SFRA covers the entire area that lies within the administrative boundary of Stevenage.
6. Level 1 Strategic Flood Risk Assessment prepared for Three Rivers District Council published in January 2012. The SFRA covers the entire area that lies within the administrative boundary of Three Rivers.
7. Strategic Flood Risk Assessment prepared for Watford Borough Council published in May 2012. The SFRA covers the entire area that lies within the administrative boundary of Watford.
8. Strategic Flood Risk Assessment prepared for Welwyn Hatfield Borough Council published in June 2016. The SFRA covers the entire area that lies within the administrative boundary of Welwyn Hatfield.
9. Level 1 Strategic Flood Risk Assessment prepared for Dacorum Borough Council, St Albans City and District Council, Three Rivers District Council and Watford Borough Council published in August 2007. The SFRA covers the entire area that lies within the administrative boundaries of Dacorum, St Albans, Three Rivers and Watford.
10. The Revised National Planning Policy Framework, published by the Department for Communities and Local Government in 2018.



11. The National Planning Practice Guidance, published by the Department for Communities and Local Government in March 2014.
12. Hertfordshire Minerals Local Plan Review 2002-2016, published by Hertfordshire County Council in March 2007.
13. Local Flood Risk Management Strategy for Hertfordshire 2013-2016: Strategy (Issues, Vision and Principles), published by Hertfordshire County Council in February 2013.
14. The European Union Water Framework Directive, December 2003.
15. River Basin Management Plan for the Thames River Basin District, published by the Environment Agency in December 2009.
16. River Basin Management Plan for the Anglian River Basin District, published by the Environment Agency in December 2009.
17. Thames Catchment Flood Management Plan, published by the Environment Agency in December 2009. The CFMP covers all of Hertfordshire except for some areas of North Herts District and Stevenage Borough.
18. The Great Ouse Catchment Flood Management Plan, published by the Environment Agency in December 2009. The CFMP covers the remaining parts of Hertfordshire that are not covered by The Thames CFMP.
19. Lower Lee Flood Risk Management Strategy, Consultation Update, published by the Environment Agency in June 2008. The FRM covers all areas situated within the Lower Lee Catchment Area.
20. The Influence of Aggregate Quarrying in River Floodplains on Biodiversity, published by Symonds Group Ltd.
21. Main Rivers GIS shape file, published by the Environment Agency.
22. Flood Zone 2 GIS shape file, published by the Environment Agency. This is the area of land that lies within the extent of the 0.1% chance flood but outside Flood Zone 3.
23. Flood Zone 3 GIS shape file, published by the Environment Agency). This is the area of land that lies within the extent of the 0.1% chance flood but outside Flood Zone 2.
24. Historic Flood Map GIS shape file, published by the Environment Agency. This shows the combined extents of known flooding from rivers, the sea and groundwater.
25. Flood Warning Areas GIS shape file, published by the Environment Agency.

26. Locations of Reservoirs GIS shape file, published by the Environment Agency.
27. Groundwater Source Protection Zones GIS shape file, published by the Environment Agency.
28. Areas susceptible to Groundwater Flooding GIS shape file, published by the Environment Agency.
29. Areas at Risk from Surface Water Flooding GIS shape file (1 in 100 year), published by the Environment Agency.