RiverOak Strategic Partners

Manston Airport Development Consent Order 2018 Consultation

Preliminary Environmental Information Report (PEIR) Volume VI Appendices 7.6-9.5

For consultation
January 2018

Scheme Name	Manston Airport DCO
Promoter's Name	RiverOak Strategic Partners Limited
Author	Wood
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Suite of Consultation Documents

1.1 As part of this second statutory consultation under section 47 of the Planning Act 2008 a suite of consultation documents relating to the proposal to reopen Manston Airport is available to the public. Together, these documents give an overview of the development proposals including information on the potential benefits and impacts of the Project. The documents also provide further information about environmental considerations following further progression of environmental assessments, as well as a draft Noise Mitigation Plan that has been developed as part of the response to the 2,200 consultation responses that were received in response to the first statutory consultation held between 12 June and 23 July 2017 ('the 2017 consultation'). Further information is also provided on how the public can submit their feedback.

1.2 Similarly to the 2017 consultation, this consultation also forms part of RiverOak's initial engagement on the design of airspace and procedures associated with the airport. As such it is a further opportunity for members of the community to highlight any factors which they believe RiverOak should take into account during that design phase. Having taken all such factors into account, the subsequent proposals for flightpaths and airspace will be subject to a separate round of consultation once the DCO application has been made.

1.3 The suite of consultation documents includes:

1.3.1 an introduction to the consultation;

1.3.2 an updated preliminary environmental information report ('PEIR');

1.3.3 a non-technical summary of the PEIR;

1.3.4 an updated masterplan;

1.3.5 a Noise Mitigation Plan;

1.3.6 a Statement of Community Consultation;

1.3.7 an updated analysis of air freight and need; and

1.3.8 a feedback form.

Appendix 7.6

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Ecological Consultants

Building inspection for bats and barn owls and reptile presence / likely absence survey

Manston Airport, Kent

RiverOak Strategic Partners

November 2017

Report ref: AFW104/R001V1

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V1	N/A	Tim Buckland BSc MSc MCIEEM	17 November 2017

Contents

1. Summary

1.1.1 RiverOak Strategic Partners intends to submit an application for development consent to reopen Manston Airport as a new air freight and cargo hub in the South East. The airport, which is located in the district of Thanet in Kent, ceased operating in 2014.

1.1.2 WSP | Parsons Brinckerhoff undertook a suite of surveys in 2015 and 2016 in order to inform an application for the mixed-use redevelopment of the site (referred to as Stone Hill Park). The surveys identified suitable habitat for common reptiles at the site as well as pipistrelle / brown long-eared summer/transitional bat roosts within four buildings (B16, B33, B41 and B54). A brown long-eared hibernation roost was also identified within one building (B33) and a barn owl roost was recorded within building B52.

1.1.3 Babec Ecological Consultants were commissioned to undertake a reptile survey and an inspection of buildings within the site for bats and barn owls, and provide a report detailing the findings. The objective was to collect up-to-date baseline information on the presence (or otherwise) of these species and determine the scope of any further surveys required to inform an ecological impact assessment.

1.1.4 All surveys were undertaken by suitably qualified, experienced and licensed ecologists between August and October 2017. The surveys were undertaken in-line with the relevant good practice guidelines. Due to access restrictions, it was not possible to survey approximately 3.9ha of suitable reptile habitat within the site boundary. There were also significant limitations to the inspection of 17 buildings for bats as a result of access restrictions, safety concerns and the absence of a loft hatch; and to the inspection of 11 buildings for barn owls as a result of access restrictions and the height of potential roosting and nesting features.

1.1.5 A single adult common lizard was recorded basking along the western site boundary during the deployment of reptile refugia, although no reptiles were recorded during any of the reptile checks. The results of the reptile survey indicate the presence of a transitory individual, or a low population of common lizards along the southernmost section of the western site boundary.

1.1.6 Evidence of bats was recorded within four buildings (B8, B16, B17 and B41) within the site. The results of the inspection indicate the presence of a hibernation roost within building B8, day / transitional roosts within buildings B16 and B41, and a night roost within building B17. No bats or evidence of bats was recorded in buildings B33 or B54, which were previously confirmed as bat roosts in 2015/16. A further 32 buildings were assessed as having the potential to support roosting bats (two buildings with high potential, six with moderate potential and 24 with low potential) as they incorporate potential roosting features.

1.1.7 Evidence of barn owls was recorded in three buildings (B11, B45 and B52) within the site. The results of the inspection indicate the presence of a temporary rest site within building B45, and occasionally used roost sites within buildings B11 and B52. No evidence of nesting barn owls was recorded during the inspection; however, buildings B11 and B52 were assessed as having the potential to support nesting barn owls as they incorporate potential nesting features.

1.1.8 All species of bat and their roosts are protected by the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended). The Wildlife and Countryside Act 1981 also affords common lizards and barn owls protection from killing and injury, and breeding barn owl's protection from reckless disturbance. Common lizard and seven species of bat are also listed as Species of Principal Importance under Section 41 of the

Natural Environment and Rural Communities Act 2006, which places a duty on the competent authorities to have regard for these species when carrying out their duties.

1.1.9 Further surveys are required to determine the presence or likely absence of reptiles in areas of suitable habitat within the site that could not be surveyed in 2017, and access should be sought to undertake detailed inspections of buildings where access restrictions were a significant limitation to the building inspection for bat and barn owl inspections.

1.1.10 Further surveys are also required to characterise the bat roosts present within six buildings (B8, B16, B17, B33, B41 and B54) and determine the presence or likely absence of roosts from a further 32 buildings assessed as having the potential to support roosting bats. A nest verification survey is required to check for the presence of barn owl breeding sites within buildings B11 and B52 and it is also recommended that all trees within the site boundary should be checked for the presence of suitable features to support roosting bats, and roosting / nesting barn owls. Detailed recommendations for further surveys are provided in Section 6.

2. Introduction

2.1 Development background

2.1.1 RiverOak Strategic Partners (hereafter referred to as 'RiverOak') intends to submit an application for development consent to reopen Manston Airport as a new air freight and cargo hub in the South East.

2.1.2 Manston Airport is located west of the village of Manston and north east of the village of Minster, within the district of Thanet in the county of Kent, see Figure 1 in Appendix A. The northern part of the site is bisected by the B2050 (Manston Road), and the site is bounded by the A299 dual carriageway to the south and the B2190 (Spitfire Way) to the west. The site is predominantly surrounded by large arable fields.

2.1.3 Although the airport was closed in May 2014, much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal remain. Much of the remainder of the site comprises large expanses of grassland which during previous operation was kept closely mown.

2.1.4 The proposed development comprises the following principal components:

- an area for cargo freight operations able to handle at least 10,000 movements per year,
- facilities for other aviation-related development, including:
  - a passenger terminal and associated facilities,
  - an aircraft teardown and recycling facility,
  - a flight training school,
  - a base for at least one passenger carrier,
  - a fixed base operation for executive travel, and
  - business facilities for aviation related organisations.

2.1.5 The proposed development is considered to be a Nationally Significant Infrastructure Project (NSIP) and requires the grant of development consent by the making of a Development Consent Order (DCO). An Environmental Impact Assessment (EIA), in accordance with the EIA Regulations, is to be prepared to support the DCO application and to ensure that any potentially significant effects of the proposed development on the environment are considered and, where appropriate, mitigated.

2.2 Ecology background

2.2.1 WSP | Parsons Brinckerhoff (WSP|PB) undertook a suite of surveys at the site in 2015 and 2016 in order to inform an application for the mixed-use redevelopment of the site (referred to as Stone Hill Park). Suitable habitat for common reptile species (adder, grass snake, slow worm and common lizard) was identified within the site in June 2015[1], although no reptile survey data has been published to date.

1 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.

2.2.2 WSP|PB assessed a total of 23 buildings within the site as having the potential to support roosting bats during an external building inspection undertaken in June 2015[2]. Internal inspections for bats were subsequently undertaken of eight of the buildings in October 2015[3]. Low numbers of pipistrelle droppings were recorded within the roof voids of buildings B16, B41 and B54, and up to 20 droppings (suspected to be brown long-eared) and one pipistrelle dropping were recorded within the underground structure of building B33*. Buildings B16, B33, B41 and B54 were subsequently confirmed as summer / transitional bat roosts.

2.2.3 Two buildings (B18 and B33) were also subject to five checks for hibernating bats in January, February and March 2016[4]. A single brown long-eared bat was recorded hibernating in a gap between an internal wall and a section of plaster board within building B33 during each of the five checks. No bats or evidence of bats was recorded in B18 during any of the checks, and this building was subsequently assessed as being unsuitable for hibernating bats due to the interior of the structure being too exposed and due to a lack of suitable crevices.

2.2.4 WSP|PB recorded a barn owl roost within building B52 in June 2015[5]. No fresh evidence of barn owls was recorded during repeat inspections of the building in January and February 2016[6].

2.3 The brief and objectives

2.3.1 Babec Ecological Consultants were commissioned to undertake a reptile survey and an inspection of buildings within the site for bats and barn owls, and provide a report detailing the findings. The objective was to collect up-to-date baseline information on the presence (or otherwise) of these species groups and determine the scope of any further surveys required to inform an ecological impact assessment.

2 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.
3 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Further Building Inspections for Bats*. Project number 70009799, Report 003, Revision 1, issued April 2016.
* Note that the building numbers used in this report differ from those used by WSP | Parsons Brinckerhoff. For reference, both building numbering systems are provided in Appendix C.
4 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Bat Hibernation Survey*. Project number 70009799, Report 006, First Issue, dated April 2016.
5 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.
6 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Wintering Bird Survey*. Project number 70009799, Report 005, Revision 1, issued April 2016.

3. Methods

3.1 Personnel

3.1.1 The reptile survey was undertaken by Jon Bannon BSc MSc MCIEEM, Tim Buckland BSc MSc MCIEEM, Shaun Pryor BSc (Hons) GradCIEEM, Jeff Turton BSc (Hons) GradCIEEM and Alexi Lamoon BSc (Hons). Tim and Jon are full members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have over seven years' experience of undertaking this type of survey, while Shaun and Jeff are graduate members of CIEEM with two years' experience of undertaking reptile surveys. Alexi has one full season of experience in undertaking reptile surveys.

3.1.2 The building inspection for bats and barn owls was undertaken by Jon Bannon and Tim Buckland with some assistance from Jeff Turton. Jon and Tim have approximately six years' experience of conducting these types of surveys and hold Natural England class licences for bats (registration numbers 2015-11543-CLS-CLS and 2015-11006-CLS-CLS, respectively) and barn owls (registration numbers CL29/00212 and CL29/00010, respectively).

3.2 Reptile survey

3.2.1 A total of 1,500 artificial reptile refugia, comprising one thousand 500mmx1000mm felts and five hundred 500mmx500mm tins, were deployed within the site between 21 and 24 August 2017. Artificial refugia were distributed across all suitable reptile habitat within the site, with a higher density of refugia deployed in the most suitable reptile habitats.

3.2.2 The artificial refugia were left in place for at least 14 days before they were checked for the presence of reptiles on seven separate occasions during suitable or optimal weather conditions. All surveys followed standard guidelines[7].

3.2.3 Weather conditions during each reptile check were noted, including the maximum and minimum temperature, humidity, precipitation, wind speed and cloud cover. The dates of the reptile checks and weather conditions recorded during the checks are provided in Appendix B.

3.3 Building inspection for bats

3.3.1 All 71 buildings within the site were inspected by licensed bat ecologists between August and October 2017. Surveyors used high powered torches, close focussing binoculars, ladders and endoscopes in order to systematically search for bats or secondary evidence of bats and record the presence of potential roosting features and potential access points for bats such as missing mortar, gaps under roof tiles and gaps around soffits / fascias. Where possible, an internal inspection was also undertaken of all buildings that incorporate potential access points for bats and have the potential to incorporate potential roosting features internally.

3.3.2 All inspections were undertaken in-line with the methods set out in The Bat Conservation Trusts' (BCT) good practice guidelines[8]. Where bat droppings were found, samples were collected to allow subsequent DNA analysis, if considered necessary. Following the inspection, each building was assessed and placed into a category (negligible, low, moderate, high or confirmed roost) for its level of potential to support roosting bats, as set out in Table 1.

7 Froglife (1999). *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife Advice Sheet 10. Froglife, Halesworth
8 Collins (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

Table 1. Categories for the level of potential of buildings to support roosting bats.

Level of potential to support roosting bats	Rationale
Negligible	No evidence of use by bats and no potential roosting features recorded.
Low	No evidence of use by bats but building offers one or more potential roosting features, although these are assessed as being of poor quality. Buildings are generally poorly linked to areas of suitable foraging habitat for bats.
Moderate	No evidence of use by bats although building offers one or more potential roosting features, normally with some connectivity to areas of suitable foraging habitat.
High	No evidence of use by bats although building offers multiple high quality potential roosting features, generally with good connectivity to areas of suitable foraging habitat.
Confirmed roost	Presence of bats or evidence of use by bats confirmed.

3.4 Building inspection for barn owls

3.4.1 A detailed building inspection was undertaken to look for evidence of barn owls and to determine the suitability of each building within the site to support roosting and nesting barn owls, in-line with standard survey protocol[9]. This included looking for potential access points, roosting features and nesting features as well as searching for barn owls and secondary evidence of barn owls, such as droppings, pellets, feathers and nest debris.

3.5 Limitations of methods

Reptile survey

3.5.1 A number of refugia deployed north of Manston Road could not be checked during some visits due to public removal (a total of 57 refugia were removed prior to visit one, 10 refugia removed prior to visit two, 25 refugia removed prior to visit three, 12 refugia removed prior to visit six, and 10 refugia removed prior to visit seven). However, as the average number of refugia that could not be checked during each visit was 16 ([57+10+25+0+0+12+10]/7), which equates to 1% of the total number of refugia checked, this is not considered to be a significant limitation to the survey. All reptile refugia were recovered and re-deployed following each visit.

3.5.2 Due to access restrictions, it was not possible to survey approximately 3.9ha of suitable reptile habitat within the site boundary, as illustrated in Figure 2 in Appendix A.

Building inspection for bats

3.5.3 The building inspection for bats was undertaken between 21 August and 17 October 2017. As detailed in Appendix C, there were significant limitations to the inspection of 17 buildings as a result of safety concerns (B1, B33, B34, B56, B61), the absence of a loft hatch (B53) and access restrictions (B5, B14, B15, B21, B22, B23, B37, B38, B43, B46, B47).

9 Shawyer (2011) *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.

3.5.4 Further surveys have been recommended for buildings where the inspection was subject to a significant limitation as a result of safety concerns or the absence of a loft hatch (buildings B1, B33, B34, B56, B61 and B53). It has also been recommended that access is sought to undertake detailed inspections of the 11 buildings where the inspection was subject to a significant limitation as a result of access restrictions (B5, B14, B15, B21, B22, B23, B37, B38, B43, B46, B47).

Building inspection for barn owls

3.5.5 The building inspection for barn owls was undertaken between 21 August and 17 October 2017. There were significant limitations to the inspection of 11 buildings as result of the height of potential roosting / nesting features (B11, B52) and access restrictions (B14, B15, B21, B22, B23, B37, B38, B46, B47) as set out in Appendix C.

3.5.6 It has been recommended that access is sought to undertake detailed inspections of the nine buildings where the inspection was subject to a significant limitation as a result of access restrictions (B14, B15, B21, B22, B23, B37, B38, B46 and B47). Further surveys have also been recommended for buildings B11 and B52, which were subject to limitations as a result of the height of potential roosting / nesting features.

General

3.5.7 It should be noted that whilst every effort has been made to provide a comprehensive assessment of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.

3.5.8 Habitats and their potential to support protected species changes over time. Therefore, the results of the surveys will become less reliable as time progresses. As a general rule, the survey results should not be relied upon after two years' from the date of the survey.

4. Results and interpretation

4.1 Reptile survey

Results

4.1.1 A single adult common lizard was recorded basking within the site (along the western site boundary, adjacent to Minster Road) during felt/tin placement on 23 August 2017, see Figure 2 in Appendix A. No reptiles were recorded during any of the seven reptile checks.

4.1.2 As set out in Appendix B, the reptile checks were undertaken in optimal or suitable weather conditions in September, which is considered to be an optimal time of year to conduct this type of survey.

Interpretation

4.1.3 Comparing the peak count (1 adult common lizard) with Froglife guidance[10], suggests the presence of a low population of common lizards along the southernmost section of the western site boundary. However, the lack of records during the subsequent checks could also indicate that the record was of a transitory individual.

4.1.4 Whilst the majority of the site comprises suitable habitat for reptiles in the form of semi-natural grassland, there is little variety in the topography or vegetation structure over much of the site and few areas of scrub to provide suitable shelter or cover. At a landscape level the site is surrounded by roads and large arable fields with narrow vegetated margins which are likely to impede connectivity for reptiles significantly.

4.1.5 It is considered likely that the site has become increasingly suitable for reptiles as a result of less intensive management of habitats since the site ceased operating as an airport in 2014, but that the poor connectivity between the site and surrounding areas of suitable reptile habitat has impeded the colonisation of the site by reptiles.

4.2 Building inspection for bats

Results

4.2.1 A total of 71 buildings (building numbers B1 – B71) were identified within the site boundary. All 71 buildings were inspected for bats between 21 August and 17 October 2017. As mentioned in Section 3.5.3 and set out in full in Appendix C, there were significant limitations to the inspection of 17 buildings as a result of safety concerns, the absence of a loft hatch and access restrictions.

4.2.2 A summary of the potential of these buildings to support roosting bats is provided in Table 2 and is illustrated on Figures 3a to 3d in Appendix A.

10 Froglife (1999). *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife Advice Sheet 10. Froglife, Halesworth

Table 2. Summary of the potential roosting suitability of buildings on site for bats.

Potential to support roosting bats	Building numbers	Total number of buildings in category
Confirmed roost	B8, B16, B17, B33, B41, B54	6
High	B1, B43	2
Moderate	B5, B18, B28, B29, B39, B53	6
Low	B2, B3, B6, B7, B11, B14, B15, B22, B25, B27, B34, B40, B44, B45, B46, B47, B50, B52, B56, B61, B62, B63, B64, B66	24
Negligible	B4, B9, B10, B12, B13, B19, B20, B21, B23, B24, B26, B30, B31, B32, B35, B36, B37, B38, B42, B48, B49, B51, B55, B57, B58, B59, B60, B65, B67, B68, B69, B70, B71	33

4.2.3 A total of six buildings with confirmed bat roosts have been identified at the site. Evidence of bats (in the form of droppings) was recorded in four of these buildings (B8, B16, B17 and B41) during the inspections. No bats or evidence of bats was recorded in buildings B33 or B54; however, these two buildings were confirmed as bat roosts in 2015/16[11,12].

4.2.4 Approximately 25 bat droppings, considered likely to belong to two species of bat (most likely brown long-eared and a Myotis species) were recorded within the interior of building B8. Three bat droppings (most likely species is brown long-eared) were recorded within the roof void of building B16 and approximately 40 mixed age droppings (most likely species is brown long-eared) were recorded within the interior of building B17. Approximately 30 suspected bat droppings (most likely a pipistrelle species) were also recorded within the roof void of building B41.

4.2.5 A further 32 buildings were assessed as having the potential to support roosting bats:

- two buildings with high potential,
- six buildings with moderate potential, and
- twenty-four buildings with low potential to support roosting bats, as they incorporate potential roosting features.

4.2.6 A total of 33 buildings were assessed as having negligible potential to support roosting bats as no potential roosting features were recorded within these buildings.

4.2.7 The full results of the building inspection for bats are provided in Table 3.

11 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.
12 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Bat Hibernation Survey*. Project number 70009799, Report 006, First Issue, dated April 2016.

Table 3. Results of the building inspection for bats.

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B1	Royal Observer Corps Monitoring post. Of concrete construction, with an open access hatch leading to small underground structure. Two small vents are also present above ground.	None	Y	No potential roosting features were noted externally, although an open entrance provides unimpeded access into the underground structure, which is considered likely to support conditions suitable for hibernating bats.	L	N	H	N	H
B2	Single storey brick sub-station building with a flat roof clad with bitumen felt. There is a small lean-to on the eastern elevation.	None	N	Putlog holes and an area of missing mortar provide potential access into the wall cavity. There is also an area of lifted felt between the main building and the lean-to on the eastern elevation.	L	N	L	N	L
B3	Single storey brick sub-station building with a flat roof clad with bitumen felt.	None	N	Putlog holes on the northern and southern elevations provide potential access points into the wall cavity.	L	N	L	N	L
B4	Small disused brick sub-station with a flat roof clad with bitumen felt.	None	N	The building is in a poor state of repair and a missing window on the northern elevation provides a potential access point for bats to the interior of the building. However, no potential roosting features were recorded within the interior of the building and no gaps are present in the brickwork or under the bitumen felt roof on the exterior. As no potential roosting features were recorded, this building is assessed as having negligible potential to support roosting bats.	N	N	N	N	N
B5	Single storey brick building with a pitched roof clad with interlocking aggregate tiles. The building is used to house communications equipment.	None	Y	There are several gaps beneath the ridge tiles, which could potentially provide access into the ridge, the cavity between the roof tiles and roof lining and/or access into the roof void (if present). There are also several gaps under the soffit which provide access to the soffit box and potentially also into the roof void (if present).	M	L	L	N	M
B6	Single storey former cargo reception building. The building, which is in a poor state of repair, is clad with wooden paneling throughout, with a wooden fascia and a flat roof. There is a small pre-fabricated extension on the eastern elevation.	None	N	Gaps under the wooden fascia provide access into the cavity behind the fascia, and potentially also into the wall cavity (if present).	L	L	L	N	L
B7	Single storey pre-fabricated portakabin, sections of which are clad with wooden paneling.	None	N	Gaps under sections of wooden paneling could provide a potential roosting feature for individual or low numbers of bats.	L	N	N	N	L
B8	A single storey brick building with a flat concrete roof clad with bitumen felt. The interior of the building is cool and dark, with evidence of damp ingress.	Approx' 25 old bat droppings (possibly from brown long eared (BLE) and a Myotis spp.) found adjacent to the northern internal wall.	N	There are vents on the eastern and western elevations, which could provide access into the wall cavity. A small gap above the door provides access to the interior of the building, where bats could roost on the interior walls, or in missing mortar on internal walls.	M	N	C	L	C
B9	A metal framed workshop building with a pitched roof. The roof and external walls are clad with corrugated metal sheeting.	None	N	The building is in a good state of repair with no potential access points or potential roosting features recorded. Furthermore, the thermal properties of the corrugated metal sheeting, which clads the building throughout, are likely to make this building unsuitable for roosting bats.	N	N	N	N	N
B10	A small storage building of breeze block construction with a flat roof clad with bitumen felt.	None	N	The building is well sealed with no potential access points for bats recorded. There are small gaps under the weather boarding on the north-western and south-eastern elevations; however, they are considered to be too shallow and exposed to provide a potential roosting feature for bats.	N	N	N	N	N
B11	A large metal framed building with a pitched roof. Both the roof and external walls are clad with corrugated metal sheeting. There are large hangar doors on the southern and northern elevations and a small lean-to on the south-west elevation. No roof void is present.	None	N	There is a potential roosting feature for crevice dwelling bats between the block walls and corrugated metal roof of the lean-to, which could be accessed via gaps in a louvered door. Gaps around the hanger doors provide potential access into the interior of the building, which could potentially be used as a night perch or feeding roost.	L	N	N	L	L

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B12	A large metal framed warehouse with a double-pitched roof. The roof and external walls are clad with corrugated metal sheeting. No roof void is present.	None	N	No potential roosting features or access points were recorded and the building is in a good state of repair. The interior of the building is light as a result of several transparent sheets in the roof.	N	N	N	N	N
B13	A small metal framed security hut with a flat roof.	None	N	No potential roosting features or access points were recorded and the building is tightly sealed and in a good state of repair.	N	N	N	N	N
B14	Large steel/breeze block warehouse with a pitched roof clad with corrugated metal sheeting.	None	Y	Putlog holes on the southern and northern elevations provide potential access into the wall cavity.	L	N	L	L	L
B15	Ancillary building with a flat roof clad with corrugated asbestos.	None	Y	A missing soffit on the southern elevation of the building provides access to a cavity between the roof and internal ceiling.	L	N	N	L	L
B16	A single storey former engineering support unit. The building has a pitched roof which is lined with bitumen felt and clad with interlocking concrete tiles. There are extensions on the north and east elevations which have flat roofs clad with bitumen felt. The main section of the building incorporates a shallow roof void (approx. 1m from floor to apex). No ridge beam is present within the roof void, and the floor is insulated with fiberglass insulation.	Three bat droppings were recorded scattered within the roof void (most likely from BLE).	N	There are several gaps beneath the ridge tiles, which could potentially provide access into the ridge and the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go on to access the roof void via gaps in the bitumen felt lining. Gaps under roof tiles are likely to provide access to the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go onto access the roof void via gaps in the bitumen felt lining. While no ridge beam is present within the roof void, bats could potentially roost between the rafters and bitumen felt.	C	M	L	N	C
B17	A large warehouse with a pitched roof clad with metal sheeting. There are two sections of brick wall and a large entrance on the front elevation. The side and rear walls comprise corrugated metal sheeting on a breeze block base. There is also a small flat-roofed extension on the northern elevation.	Approx' 40 mixed age droppings (most likely from BLE) mainly scattered alongside the eastern and western walls. The absence of feeding remains, and restricted roosting features above most of the droppings indicates the most likely use of this building as a night roost.	N	Gaps around the main entrance provide access to the interior of the building. Narrow gaps in the concrete beams, and gaps between concrete beams and brick walls provide potential day roosting opportunities for low number of bats. A gap under a fascia provides access to the interior of the extension on the norther elevation.	M	N	L	C	C
B18	A brick/concrete bunker with three open entrances. Externally, the structure is clad with dense ivy, which has grown over the entrances on the northern and western elevations.	None	N	Hibernating bats could roost on interior walls, or in small crevices in the concrete walls.	N	N	M	N	M
B19	Small wooden framed building with a flat roof. The walls and roof are clad with corrugated metal sheets.	None	N	The building is in a poor state of repair and several gaps under corrugated metal sheets provide potential access points to the interior of the building. However, no potential roosting features were recorded on the exterior of the building or within its interior. Furthermore, no wall cavity is present and the thermal properties of the corrugated metal sheeting, which clads the building throughout, are likely to make this building unsuitable for roosting bats.	N	N	N	N	N

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B20	A small wooden shed with a flat roof clad with bitumen felt. The building is also clad with dense ivy.	None	N	The building is in a poor state of repair and an open door and small vent provide potential access points to the interior of the building. However, no potential roosting features were recorded within the interior of the building which is very small (approximately 2m x 2m x 2.5m). Furthermore, no wall cavity is present and no suitable gaps were recorded under the ivy which clads the exterior of the building.	N	N	N	N	N
B21	A large warehouse with a pitched roof clad with corrugated metal sheeting. The walls are also clad with corrugated metal sheeting.	None	Y	The building is in a good state of repair and no potential access points or roosting features were noted on the exterior of the building. While it was not possible to access the interior of the building, the thermal properties of the corrugated metal sheeting, which clads the building throughout, are likely to make this building unsuitable for roosting bats.	N	N	N	N	N
B22	Two Nissen huts adjoined by a makeshift wooden framed extension with a flat roof. Each Nissen hut has brick walls and base, and is clad with corrugated metal sheeting.	None	Y	Gaps around the doors and wall on the south-eastern elevation provide access to the interior of the building, which could incorporate potential roosting features for bats.	L	N	L	L	L
B23	A single storey wooden storage building with a flat roof clad with corrugated metal.	None	Y	While no potential roosting features or access points were recorded, there was only a very limited view of this building due to access restrictions.	N	N	N	N	N
B24	A small single storey building with a flat roof clad with bitumen felt. Radar equipment is present on the roof.	None	N	While a missing vent on the northern elevation provides a potential access point to the interior of the building, no potential roosting features were recorded within the interior of the building which is small and cluttered with machinery. Furthermore, no potential roosting features were recorded on the exterior of the building, which is rendered with cement and has no soffit / fascia.	N	N	N	N	N
B25	The RAF Manston History Museum. The building has a triple pitched roof which is clad with corrugated metal. The building is of breeze block construction and has wooden soffits. No roof void is present.	None	N	Gaps under soffits could provide access to suitable cavities for crevice dwelling bats.	L	N	N	N	L
B26	A small brick building with a flat roof clad with bitumen felt. The building incorporates a uPVC soffit and fascia.	None	N	No potential access points or potential roosting features were recorded on the exterior of this building, which is very small (2m x 2m x 2.5m) and in a good state of repair. No gaps were noted around the soffit box or fascia.	N	N	N	N	N
B27	Spitfire and Hurricane Memorial building. The building is of brick construction with a flat roof clad with metal sheeting. There are various flat roofed extensions on the south and west elevations of the building. No roof void is present.	None	N	There are gaps under a wooden fascia on a small section of the building, which could provide roosting opportunities for low numbers of crevice dwelling bats.	L	N	N	N	L
B28	A three storey former control tower. The building is clad with concrete cladding and has a flat roof clad with bitumen felt. There is a flat roofed pre-fabricated extension on the northern elevation.	None	N	There are several gaps in the concrete cladding, which provide access to a lined cavity between the external walls and the cladding.	M	L	L	N	M
B29	Former Air Traffic Engineering building. The building is of brick construction with a pitched roof clad with interlocking aggregate tiles. The roof void is internally partitioned into two sections; each is lined with bitumen felt (which is torn in places) with fiberglass insulation on the floor. No ridge beams are present and the roof voids are relatively uncluttered.	None	N	There are several gaps beneath the ridge tiles, which are likely to provide access into the ridge as well as the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go on to access the roof void via gaps in the bitumen felt lining. Gaps under roof tiles provide access to the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go on to access the roof void via gaps in the bitumen felt lining. Gaps in the fascias provide access to the soffit box and the roof void. While no ridge beam is present within the roof void, bats could potentially roost alongside the rafters and bitumen felt and/or in crevices between the gable walls and the roof. An area of missing mortar on the western elevation provides potential access into the wall cavity.	M	M	L	N	M

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B30	A single storey prefabricated portakabin with a flat roof clad with bitumen felt.	None	N	No potential roosting features or access points for bats were recorded and the building is in a good state of repair throughout. No gaps were noted around the soffit box or fascia.	N	N	N	N	N
B31	A single storey prefabricated portakabin with a flat roof.	None	N	The building is in a poor state of repair and an open door and smashed window provide potential access points to the interior of the building. However, no potential roosting features were recorded within the interior or on the exterior of the building.	N	N	N	N	N
B32	A single storey building rendered in pebbledash. The building has a pitched roof which is clad with corrugated metal sheeting.	None	N	No potential roosting features or access points were recorded on the exterior of the building and the thermal properties of the corrugated metal roof are likely to make this building unsuitable for roosting bats.	N	N	N	N	N
B33	A brick built structure comprising a small above ground tower and a staircase leading to a series of underground rooms. Some of the interior walls are rendered or clad with plaster boarding (which is in a poor state of repair) whilst others are bare brick. There is evidence of damp ingress throughout the below-ground structure.	None	Y	Bats can access the underground structure via a missing manhole cover on the roof of the tower and via an open stairway. Non-crevice dwelling bats could potentially roost on open surfaces throughout the underground structure. There are also suitable roosting features for crevice dwelling species, including gaps between brickwork, and cavities between plaster boarding and internal walls.	C*	N	C+	L	C*
B34	A small electrical sub-station building, which is rendered with pebble dash and has a shallow sloped roof clad with corrugated asbestos.	None	Y	Bats could access the interior of the building via two vents, which are present on the northern elevation.	L	N	L	N	L
B35	A small disused ancillary building of brick construction, with a flat roof clad with bitumen felt.	None	N	No potential roosting features were recorded on the exterior or within the interior of the building.	N	N	N	N	N
B36	A large metal tower with adjoining pre-fabricated metal building at base.	None	N	No potential roosting features were recorded on the exterior of the tower, which is of metal construction and is open and exposed. The adjoining metal building is in a good state of repair with no potential access points or roosting locations.	N	N	N	N	N
B37	A single storey brick electrical sub-station building with a flat roof.	None	Y	While it was only possible to view the southern and eastern elevations of this building, it appears to be in a good state of repair, with no gaps around the brickwork or under the flat roof. No potential roosting features were recorded during the inspection.	N	N	N	N	N
B38	A small single storey brick electrical substation building with a flat roof.	None	Y	While it was only possible to view the southern and eastern elevations of this building, it appears to be in a good state of repair, with no gaps around the brickwork or under the flat roof. No potential roosting features were recorded during the inspection.	N	N	N	N	N
B39	A single storey brick building rendered with pebbledash with a sloping roof clad with corrugated asbestos. The building is surrounded by dense scrub and sycamore trees.	None	N	An open entrance on the western elevation provides access to the interior of the building, where non-crevice dwelling bats could potentially roost on open surfaces throughout. There are also day roosting opportunities above a false ceiling.	L	N	M	L	M
B40	A single storey brick building rendered with cement with a flat roof clad with bitumen felt.	None	N	Areas of missing mortar and gaps under the fascia provide potential day roosting opportunities for crevice dwelling species of bat.	L	N	N	N	L

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B41	A single storey wooden framed building with a simple pitched roof lined with bitumen felt and clad with interlocking aggregate tiles. A long and shallow (approximately 1.2m floor to apex) roof void is present. The roof void is relatively uncluttered with fiberglass insulation on the floor. No ridge beam is present within the roof void.	Approx. 30 suspected bat droppings (most likely pipistrellus species) scattered under the roof apex within the roof void.	N	There are several gaps beneath the ridge tiles, which are likely to provide access into the ridge as well as the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go on to access the roof void via gaps in the bitumen felt lining. Gaps under roof tiles provide access to the cavity between the roof tiles and the bitumen felt lining. Bats could potentially go on to access the roof void via gaps in the bitumen felt lining. Gaps under the fascia on the eastern and western elevations provide potential roosting opportunities for crevice dwelling species of bat, and also potential access to the roof void. While no ridge beam is present within the roof void, bats could potentially roost alongside the rafters and bitumen felt.	C*	L	L	N	C*
B42	A single storey pre-fabricated building on a brick base. The building has a flat roof clad with bitumen felt, and external walls clad with wooden panels.	None	N	No potential roosting features or access points were recorded on the exterior of the building.	N	N	N	N	N
B43	A single storey brick building with a pitched and hipped roof clad with clay tiles. There is a small extension on the western elevation, which has a flat roof clad with bitumen felt. The building has wooden soffits and fascias.	None	Y	Gaps underneath ridge and hip tiles are likely to provide access into the ridge/hip tiles and potentially also to a roof void (if present). Gaps under clay roof tiles are likely to provide access to a cavity between the tiles and the roof lining, and may also provide access to a roof void (if present). A gap under the soffit on the southern elevation could provide access to the soffit box and potentially also to a roof void (if present).	H	M	L	N	H
B44	The former passenger terminal, comprising a single storey building of breeze block and timber construction with a flat roof clad with bitumen felt. The southern section of the building incorporates a pitched roof clad with corrugated metal sheeting.	None	N	Gaps under the fascia on the northern, eastern and western elevations of the building lead into a suitable cavity for crevice dwelling bats. There is also a potential roosting opportunity for crevice dwelling bats underneath some lifted plywood sheeting on the eastern elevation.	L	L	N	N	L
B45	A steel framed Nissen hut clad with corrugated metal sheeting with breeze block walls on the eastern and western elevations.	None	N	Bats can access the interior of the building via gaps above the doors on the eastern and western elevations, and via large gaps in the corrugated metal sheeting. There is potential for crevice dwelling species of bat to roost between the metal roof and the breeze block walls on the eastern and western elevations.	L	N	N	L	L
B46	A large warehouse with a pitched roof clad with corrugated asbestos. There are extensions on the northern, eastern, southern and western elevations.	None	Y	Bats could access the interior of the building via gaps under corrugated asbestos sheeting, and via a louvered grille and a gap around an entrance on the northern elevation. It is not known whether the interior of the building incorporates any potential roosting features.	L	L	L	L	L
B47	A single storey building of breeze block construction with a flat roof clad with bitumen felt. There is a wooden fascia on the eastern, southern and western elevations.	None	Y	Gaps under the wooden fascia could provide roosting opportunities for crevice dwelling bats. Bats could potentially access the interior of the building via gaps around a door on the southern elevation of the building. It is not known whether the interior of the building incorporates any potential roosting features.	L	N	N	L	L
B48	A single storey metal framed portakabin with a flat roof clad with metal sheeting.	None	N	While the building is generally in a poor state of repair, no potential access points for bats to the interior of the building were recorded and no potential roosting features were recorded on the exterior of the building.	N	N	N	N	N
B49	A small single storey brick building with a flat roof clad with bitumen felt. There is a large metal beacon on top of the roof.	None	N	The building is in a good state of repair, and no potential access points or potential roosting features were recorded on the exterior of the building.	N	N	N	N	N
B50	A single storey building of concrete construction with a flat roof clad with bitumen felt. There is a metal lookout tower on top of the roof.	None	N	Gaps under fascias could provide roosting opportunities for crevice dwelling bats.	L	N	N	N	L

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B51	A small metal framed ancillary building with a simple pitched roof clad with corrugated metal. The walls are also clad with corrugated metal.	None	N	No potential roosting features or access points were recorded on the exterior of the building. Furthermore, the thermal properties of the corrugated metal sheeting, which clads the building throughout, are likely to make this building unsuitable for roosting bats.	N	N	N	N	N
B52	The former fire and rescue building; of breeze block construction with corrugated metal cladding on the walls and a flat roof. There is an observation tower on the western section of the building and four large entrances on the southern elevation, which were formerly used for vehicular access. There is a large brick chimney on the northern elevation and remnants of a suspended ceiling present within the building.	None	N	Numerous gaps under the fascias and missing mortar on the chimney could provide potential roosting opportunities for crevice dwelling bats. While there is access to the interior of the building via open entrances on the southern elevation, smashed windows on the northern and eastern elevations and a louvered grill on the western elevation, no potential roosting features were recorded within the building.	L	N	N	L	L
B53	A small brick building with a pitched roof clad with interlocking concrete tiles. The building incorporates uPVC fascias and soffits.	None	Y	Gaps under the fascia on the eastern and western elevations provide access to a cavity between the roof tiles and the roof lining, and may also provide access to a roof void.	M	L	L	N	M
B54	A single storey building of brick construction with a Dutch gable roof clad with interlocking concrete tiles. Gable walls on the eastern and western elevations are clad with corrugated metal sheeting. There is a small hexagonal and flat roofed extension on the western elevation. The roof is of modern truss construction and incorporates a large but cluttered roof void. The roof is lined with bitumen felt with fiberglass insulation between the floor joists. No ridge beam is present.	None	N	Gaps under roof tiles provide access to the cavity between the roof tiles and the bitumen felt lining. There are large gaps under the fascia on the gable walls which provide access into the roof void where bats could roost alongside the rafters and bitumen felt lining. There are several gaps under the lead flashing on the hexagonal extension, which could provide access to a cavity between the roof tiles and the roof lining. There is a small section of missing mortar on the north-eastern corner of the building that could a provide roosting opportunity for crevice dwelling species.	C*	L	L	N	C*
B55	A large steel framed aircraft hangar with a shallow pitched roof. The walls and roof are clad with corrugated metal and there are large hangar doors on the southern elevation.	None	N	No potential roosting features were recorded on the exterior of the building. While there are some small gaps on the exterior of the building that could provide potential access to bats to the interior, no potential roosting features were recorded within the interior of the building which is well lit as a result of several transparent sheets in the roof.	N	N	N	N	N
B56	A single storey brick building with a flat roof clad with bitumen felt. There is a small extension on the eastern elevation which has a sloping roof clad with asbestos sheeting.	None recorded	Y	Gaps under the fascia on the southern elevation could provide roosting opportunities for crevice dwelling bats. Bats could potentially access the interior of the building via gaps under the corrugated asbestos sheeting and a small area of missing mortar on the south-eastern corner of the building.	L	N	L	N	L
B57	A small outbuilding clad of uPVC construction.	None	N	No potential roosting features or access points were recorded on the exterior of the building.	N	N	N	N	N
B58	A metal water storage tank.	None	N	No potential roosting features were recorded.	N	N	N	N	N
B59	A prefabricated concrete garage with a pitched roof clad with bitumen felt.	None	N	No potential roosting features were recorded on the exterior of the building. While there is a small gap above the entrance on the western elevation that could provide potential access for bats to the interior, no potential roosting features were recorded within the interior of the building.	N	N	N	N	N
B60	A single storey building of breeze block construction with a half-pitched roof clad with corrugated metal sheeting. The eastern section of this building has recently been demolished and replaced with a small wooden extension.	None	N	No potential roosting features were recorded on the exterior of the building. While there are several small gaps providing potential access for bats to the interior, no potential roosting features were recorded within the interior of the building.	N	N	N	N	N

Building number	Description	Evidence of bats recorded	Significant limitations to inspection^	Potential roosting features and access points	Potential to support roost				
					Day / trans	Mat.	Hib.	Night / feeding	Overall
B61	A single storey workshop with a pitched roof. The walls and roof are clad with corrugated asbestos and there is a flat-roofed extension on the northern elevation. A large plastic sheet has been installed at eaves height, creating a roof void. Several large holes were noted within the plastic sheeting.	None	Y	Bats could access the interior of the building via gaps under ridge tiles and gaps under corrugated asbestos sheeting. The ridge tiles provide a potential roosting opportunity for non-crevice dwelling species, and a gap under some chipboard sheeting on the western elevation provides roosting opportunities for crevice dwelling bats.	L	N	N	L	L
B62	A single storey brick building with a Dutch gable roof lined with bitumen felt and clad with interlocking aggregate tiles. The gable ends are clad with corrugated metal sheeting. The building incorporates a cluttered roof void (approximately 1.2m floor to apex). No ridge beam is present and there is fiberglass insulation between the floor joists.	None	N	Gaps under the soffit on the eastern, southern and western elevations, and gaps under the corrugated metal sheeting on the gable ends provide access to the roof void, where bats could potentially roost alongside the rafters and bitumen felt. Missing mortar on the hip starter on the north-eastern extent of the building could provide access into the hip tile, and potentially also to the cavity between the roof tiles and the bitumen felt. A gap under a roof tile on the western elevation also potentially provides access to the cavity between the roof tiles and the bitumen felt.	L	N	L	N	L
B63	A single storey building with a flat roof clad with bitumen felt. The exterior of the building has been rendered with cement.	None	N	A gap under the fascia and a gap between the bitumen felt on the northern elevation provide potential roosting opportunities for crevice dwelling bats.	L	N	N	N	L
B64	A single storey building of breeze block construction with a flat roof clad with bitumen felt. There are fascias on the eastern and western elevations.	None	N	Gaps under the fascias on the eastern and western elevations provide access to small crevices between the walls and the roof.	L	N	N	N	L
B65	A small wooden shed with a flat roof clad with bitumen felt.	None	N	No potential roosting features were recorded.	N	N	N	N	N
B66	A single storey building of breeze block construction with a flat roof clad with corrugated asbestos sheeting. The building is in a poor state of repair.	None	N	Crevice dwelling bats could potentially roost between the corrugated asbestos sheeting and the walls. There is access to the interior of the building via open doors, an open window and a hole in the blockwork.	L	N	N	L	L
B67	A large metal storage tank.	None	N	No potential roosting features were recorded.	N	N	N	N	N
B68	A large metal storage tank.	None	N	No potential roosting features were recorded.	N	N	N	N	N
B69	A small portakabin with a flat roof clad with bitumen felt.	None	N	While the building is in a poor state of repair, no potential roosting features or access points were recorded on the exterior of the building.	N	N	N	N	N
B70	A small wooden shed with a flat roof clad with bitumen felt.	None	N	No potential roosting features were recorded.	N	N	N	N	N
B71	A small storage building of breeze block / shiplap boarding construction, with a flat roof clad with bitumen felt.	None	N	No potential roosting features were recorded.	N	N	N	N	N

^ = further details of limitations are provided in Appendix C
Trans. = transitional roost | Hib. = hibernation | Mat. = maternity
C= confirmed roost | H = high potential to support roost | M= moderate potential to support roost | L = low potential to support roost | N = negligible potential to support roost
* Previously confirmed as a roost by WSP | PB[13]
+ Previously confirmed as a roost by WSP | PB[14]

13 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Further Building Inspections for Bats*. Project number 70009799, Report 003, Revision 1, issued April 2016.
14 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Bat Hibernation Survey*. Project number 70009799, Report 006, First Issue, dated April 2016.

Interpretation

4.2.8 A summary of the roosts recorded within the site to date are provided in Table 4. While further surveys are required in order to accurately characterise the types of roosts present (no emergence or return to roost survey have been undertaken of these buildings to date), Table 4 also includes our preliminary interpretation of the likely roost types have also been provided, which comprise:

- one night roost,
- two hibernation roosts, and
- four day / summer / transitional roosts.

Table 4. Summary of roosts recorded to date and interpretation of roost types.

Building number	Previous survey information*	Evidence of bats recorded during 2017 building inspection	Preliminary interpretation of roost type(s)
B8	No evidence of bats was recorded within this building, which was assessed as having low potential to support summer / transitional and hibernation roosts.	Approximately 25 old bat droppings (likely from two species of bat) were recorded adjacent to an internal wall.	Given that the interior of the building is cool and undisturbed with evidence of damp ingress, the droppings are considered most likely to indicate the presence of a **hibernation roost**. The most likely species considered to be brown long-eared and myotis. The building also has the potential to support day / transitional and night / feeding roosts.
B16	Low numbers of pipistrelle droppings were recorded in the roof void in June 2015, and the building was subsequently confirmed as a summer / transitional roost. The building was also assessed as having the potential to support a maternity roost.	Three bat droppings were recorded scattered within the roof void (most likely species is brown long-eared bat).	The results of the survey confirm the presence of a **day / transitionary roost** within the roof void. The most likely species is considered to be brown long-eared and/or a pipistrelle species. The building is also assessed as having the potential to support maternity and hibernation roosts.
B17	No evidence of bats was recorded within this building, which was assessed as having negligible potential to support roosting bats.	Approximately 40 mixed age droppings (most likely species is brown long-eared bat) were recorded within the building, with droppings predominantly scattered alongside the eastern and western walls.	The absence of feeding remains and restricted day roosting features above most of the droppings indicates that this building is most likely used as a **night roost**. The most likely species is considered to be brown long-eared bat. The building is also assessed as having the potential to support day / transitionary and hibernation roosts.

Building number	Previous survey information*	Evidence of bats recorded during 2017 building inspection	Preliminary interpretation of roost type(s)
B33	Up to 20 droppings (suspected to be brown long-eared) and one pipistrelle dropping were recorded in the underground structure in June 2015, and this building was subsequently confirmed as a summer / transitional bat roost. An individual brown long-eared bat was recorded in the underground structure during each of the five hibernation checks undertaken in January, February and March 2016, confirming this building as a hibernation roost.	No evidence of bats was recorded. The building was also assessed as having the potential to support a night / feeding roost.	The results of previous surveys have confirmed the presence of a brown long-eared **hibernation roost**, and a **summer / transitional roost** within this building. The building also has the potential to support a night / feeding roost.
B41	Low numbers of pipistrelle droppings were recorded in the roof void in June 2015 and this building was subsequently confirmed as a summer / transitional bat roost.	Approximately 30 suspected bat droppings (most likely pipistrellus species) were recorded scattered under the roof apex within the roof void.	The building was confirmed as a **summer / transitional roost**, with the most likely species comprising a pipistrelle. The building is also assessed as having the potential to support maternity and hibernation roosts.
B54	Low numbers of pipistrelle droppings were recorded in the roof void in June 2015 and this building was subsequently confirmed as a summer / transitional bat roost.	No evidence of bats was recorded. The building was also assessed as having the potential to support maternity and hibernation roosts.	The building was previously confirmed as a **summer / transitional roost,** with the most likely species comprising a pipistrelle. The building is also assessed as having the potential to support maternity and hibernation roosts.

* Previous survey information recorded by WSP | Parsons Brinckerhoff and detailed in separate reports[15, 16, 17].

15 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.
16 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Further Building Inspections for Bats*. Project number 70009799, Report 003, Revision 1, issued April 2016.
17 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Bat Hibernation Survey*. Project number 70009799, Report 006, First Issue, dated April 2016.

4.3 Building inspection for barn owls

Results

4.3.1 Evidence of barn owls was recorded in three buildings (B11, B45 and B52) within the site, comprising:

- a total of ten mixed-age pellets within building B11,
- two old pellets within building B45, and
- approximately 25 mixed-age pellets within building B52.

4.3.2 No evidence of nesting barn owls was recorded during the inspection; however, buildings B11 and B52 were assessed as having the potential to support nesting barn owls as they incorporate potential nesting features.

4.3.3 All other buildings within the site were assessed as having negligible potential to support barn owls as they do not incorporate potential access points and/or potential roosting or nesting features.

4.3.4 The results of the building inspection for barn owls are provided in Table 5 and are illustrated on Figures 4a to 4d in Appendix A.

Interpretation

4.3.5 The results of the surveys confirm the presence of barn owl roosts within buildings B11, B45 and B52. The low number of pellets recorded within building B45 indicate the presence of a temporary rest site (as defined by Shawyer, 2011[18]) within this building, while the number of pellets recorded within B11 and B52 are consistent with the presence of occasionally used roost sites. Barn owls are known to have roosted within building B52 since at least 2015[19], and the absence of fresh evidence of barn owls during January and February 2016 suggests that the roost is likely to be inactive during the winter period[20].

18 Shawyer (2011) *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.
19 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Extended Phase 1 Habitat Survey*. Project number 70009799, Report 001, Revision 2, issued April 2016.
20 WSP | Parsons Brinckerhoff (2016) *Stone Hill Park – Wintering Bird Survey*. Project number 70009799, Report 005, Revision 1, issued April 2016.

Table 5. Results of the building inspection for barn owls.

Building number	Evidence of barn owls recorded	Potential access points	Potential roosting features	Potential nesting features	Potential to support	
					Roosts	Nests
B1	None	An open entrance provides access into the underground structure.	None	None	N	N
B2	None	None	N/A	N/A	N	N
B3	None	None	N/A	N/A	N	N
B4	None	A gap in the wall on the northern elevation provides access to the interior of the building.	None	None	N	N
B5	None	None	N/A	N/A	N	N
B6	None	None	N/A	N/A	N	N
B7	None	None	N/A	N/A	N	N
B8	None	None	N/A	N/A	N	N
B9	None	None	N/A	N/A	N	N
B10	None	None	N/A	N/A	N	N
B11	Nine mixed-age barn owl pellets were recorded within a small lean-to (which houses a boiler room) on the south-west elevation of the building. This confirms the presence of a barn owl roost within this section of the building, with the roost located above a boiler flue. A single barn owl pellet was also recorded within the main building.	An open door provides access to the lean-to. Large gaps around the hangar doors on the southern and northern elevations provide access into the main building.	Barn owls could roost on the steel frame and ventilation housing inside the main building.	Barn owls could potentially nest above the boiler flues in the lean-to, as well as on top of the ventilation housing in the main building.	C	P
B12	None	None	N/A	N/A	N	N
B13	None	None	N/A	N/A	N	N
B14	None	There is a large open entrance on the eastern elevation which provides access to the interior of the building.	None identified	None identified	N	N
B15	None	None identified	N/A	N/A	N	N
B16	None	None	N/A	N/A	N	N
B17	None	None	N/A	N/A	N	N
B18	None	Three open entrances provide access to the interior of the structure.	None	None	N	N
B19	None	None	N/A	N/A	N	N
B20	None	None	N/A	N/A	N	N
B21	None	None identified	N/A	N/A	N	N
B22	None	None identified	N/A	N/A	N	N
B23	None	None identified	N/A	N/A	N	N
B24	None	None	N/A	N/A	N	N
B25	None	None	N/A	N/A	N	N
B26	None	None	N/A	N/A	N	N
B27	None	None	N/A	N/A	N	N

Building number	Evidence of barn owls recorded	Potential access points	Potential roosting features	Potential nesting features	Potential to support	
					Roosts	Nests
B28	None	None	N/A	N/A	N	N
B29	None	None	N/A	N/A	N	N
B30	None	None	N/A	N/A	N	N
B31	None	An open entrance on the southern elevation provides access to the interior of the structure.	None	None	N	N
B32	None	None	N/A	N/A	N	N
B33	None	There is access to the interior of an above ground tower and the underground structure via a missing manhole cover.	None	None	N	N
B34	None	None	N/A	N/A	N	N
B35	None	None	N/A	N/A	N	N
B36	None	There is open access to the metal tower. No access points were noted on the adjoining building.	None	None	N	N
B37	None	None identified	N/A	N/A	N	N
B38	None	None identified	N/A	N/A	N	N
B39	None	An open entrance on the western elevation provides access to the interior of the building.	None	None	N	N
B40	None	None	N/A	N/A	N	N
B41	None	None	N/A	N/A	N	N
B42	None	None	N/A	N/A	N	N
B43	None	None	N/A	N/A	N	N
B44	None	None	N/A	N/A	N	N
B45	Two old barn owl pellets were recorded below an interior wall on the western elevation of the building, confirming the presence of a barn owl roost in this location.	Barn owls could access the interior of the building via gaps above doors on the eastern and western elevations, and via large gaps in the corrugated metal sheeting.	Barn owls could also potentially roost on top of the interior wall on the eastern elevation of the building.	None	C	N
B46	None	None identified	N/A	N/A	N	N
B47	None	None identified	N/A	N/A	N	N
B48	None	None	N/A	N/A	N	N
B49	None	None	N/A	N/A	N	N
B50	None	None	N/A	N/A	N	N
B51	None	None	N/A	N/A	N	N
B52	Approximately 25 mixed age pellets were recorded scattered beneath the exposed runners of the suspended ceiling, confirming the presence of a barn owl roost in this location.	Barn owls could access the interior of the building via open entrances on the southern elevation and smashed windows on the northern and eastern elevations	No further potential roosting locations were identified.	Barn owls could potentially nest on ceiling tiles, wall plates and on top of an exposed water tank.	C	P
B53	None	None	N/A	N/A	N	N
B54	None	None	N/A	N/A	N	N

Building number	Evidence of barn owls recorded	Potential access points	Potential roosting features	Potential nesting features	Potential to support	
					Roosts	Nests
B55	None	None	N/A	N/A	N	N
B56	None	None	N/A	N/A	N	N
B57	None	None	N/A	N/A	N	N
B58	None	None	N/A	N/A	N	N
B59	None	None	N/A	N/A	N	N
B60	None	None	N/A	N/A	N	N
B61	None	Barn owls could potentially access the interior of the building via gaps around the entrance on the western elevation.	None identified	None identified	N	N
B62	None	None	N/A	N/A	N	N
B63	None	None	N/A	N/A	N	N
B64	None	None	N/A	N/A	N	N
B65	None	None	N/A	N/A	N	N
B66	None	Barn owls could potentially access the interior of the building via an open door on the northern elevation.	None	None	N	N
B67	None	None	N/A	N/A	N	N
B68	None	None	N/A	N/A	N	N
B69	None	None	N/A	N/A	N	N
B70	None	None	N/A	N/A	N	N
B71	None	None	N/A	N/A	N	N

C= confirmed | P = potential | N= negligible

5. Legislation and planning policy

5.1 Reptiles

5.1.1 Common lizards are afforded protection from killing and injury under the Wildlife and Countryside Act 1981 (as amended)[21]. Common lizard is also listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006[22] and is a priority species in the Kent Biodiversity Action Plan[23]. This places a duty on the competent authorities to have regard for this species when carrying out their duties.

5.1.2 In addition to the above, the government circular 06/2005[24] states that the presence of protected species is a material consideration in the planning process and the National Planning Policy Framework (NPPF) 2012[25] states that "*The planning system should contribute to and enhance the natural and local environment by…. minimising impacts on biodiversity and providing net gain in biodiversity*."

5.1.3 Further survey is required to determine the presence or likely absence of reptiles in areas of suitable habitat within the site that could not be surveyed in 2017 (see Figure 2 in Appendix A). Our recommendations for further survey for reptiles are detailed in Section 6.1.

5.2 Bats

5.2.1 All species of bat and their roosts are protected by the Conservation of Habitats and Species Regulations 2010 (as amended)[26], and the Wildlife and Countryside Act 1981 (as amended). Taken together, these make it an offence to:

- Deliberately capture, injure or kill a bat.
- Deliberately disturb a bat in such a way as to be likely to:
  - Impair its ability to survive, to breed or reproduce, or to rear or nurture its young.
  - Impair its ability to hibernate or migrate.
  - Affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a bat.
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.
- Disturb a roosting bat or obstruct access to a roost or place of shelter.

5.2.2 Seven species of bat, including soprano pipistrelle and brown long-eared, are listed as Species of Principal Importance under the NERC Act 2006 and three species of bat, including soprano pipistrelle and brown long-eared, are also listed as priority species in the Kent Biodiversity Action

21 Her Majesty's Stationary Office (1981). *Wildlife and Countryside Act.*
22 Natural Environment and Rural Communities (NERC). *Natural Environment and Rural Communities (NERC) Act 2006*. March 2006
23 Kent County Council (2017). *Biodiversity – Action for Kent's Wildlife*. http://www.kentbap.org.uk, accessed 31 October 2017.
24 Office of the Deputy Prime Minister (2005). *Government circular 06/2005: Biodiversity and geological conservation statutory obligations and their impact within the planning system.*
25 Department for Communities and Local Government (2012) *National Planning Policy Framework.*
26 Her Majesty's Stationary Office (2010). *The Conservation of Habitats and Species Regulations.*

Plan. This places a duty on the competent authorities to have regard for these species when carrying out their duties.

5.2.3 In addition to the above, the government circular 06/2005 states that the presence of a protected species is a material consideration in the planning process and paragraph 118 of the NPPF states that "*... if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*."

5.2.4 Further survey is required to characterise the roosts present within six buildings (B8, B16, B17, B33, B41 and B54), determine the presence or likely absence of roosts from a further 32 buildings assessed as having the potential to support roosting bats, and to check for the presence of roosts within trees within the site boundary. Our recommendations for further surveys for bats are detailed in Section 6.2.

5.2.5 Further surveys will be not be required of the 33 buildings assessed as having negligible potential to support roosting bats, in-line with BCT guidelines[27].

5.3 Barn owls

5.3.1 Barn owls are afforded protection against killing, injury and capture under the Wildlife and Countryside Act 1981 (as amended). Barn owl nests and eggs are also afforded protection and breeding barn owls are protected against reckless disturbance while at or near the nest.

5.3.2 In addition to the above legislation, the government circular 06/2005 states that the presence of protected species is a material consideration in the planning process and the NPPF states that "*The planning system should contribute to and enhance the natural and local environment by.... minimising impacts on biodiversity and providing net gain in biodiversity*."

5.3.3 In the first instance, a nest verification survey should be undertaken to check for the presence of breeding sites within buildings B11 and B52. It is also recommended that all trees within the site boundary should be checked for the presence of suitable features to support roosting and/or nesting barn owls. Our recommendations for further surveys for barn owls are detailed in Section 6.3.

27 Collins (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

6. Recommendations for further survey

6.1 Reptiles

6.1.1 Further survey should be undertaken to determine the presence or likely absence of reptiles from the 3.9ha of suitable reptile habitat within the site boundary that could not be surveyed in 2017. This will comprise deploying a sufficient density of artificial refugia across all areas of suitable reptile habitat not previously surveyed and checking them on seven separate occasions for the presence of reptiles during suitable weather conditions, in-line with good practice guidelines[28]. The optimal months for conducting reptile surveys are April, May and September.

6.2 Bats

6.2.1 Access should be sought to 11 buildings (B5, B14, B15, B21, B22, B23, B37, B38, B43, B46 and B47) to undertake detailed inspections, as access restrictions were a significant limitation to the inspection of these buildings.

6.2.2 DNA analysis should be carried out on the samples of bat droppings collected from four buildings (B8, B16, B17 and B41) to determine the species of bat(s) present.

6.2.3 A ground level assessment should also be undertaken of each tree within the site to look for evidence of bats and the presence of potential roosting features. Ground level tree assessments are best undertaken in winter when trees are not in leaf.

6.2.4 A suite of further surveys should then be undertaken of the six buildings confirmed as roosts (B8, B16, B17, B33, B41 and B54) and the 32 buildings assessed as having the potential to support roosting bats following BCT guidelines[29]. Detailed recommendations for further survey are provided in Table 6 and a summary is provided below:

- One emergence or return to roost survey of buildings with low potential to support roosting bats, undertaken between May and August (inclusive). For buildings with the potential to support a maternity roost, the survey visit should be undertaken during June or July.
- One emergence and one return to roost survey of buildings with moderate potential to support roosting bats, undertaken between May and August (inclusive). For buildings with the potential to support a maternity roost, at least one of the survey visits should be undertaken during June or July.
- Three survey visits of confirmed roosts and buildings with high potential to support roosting bats, undertaken between May and August (inclusive). For buildings with the potential to support a maternity roost, at least one of the survey visits should be undertaken during June or July.
- For buildings with low or moderate potential to support hibernation roosts, two checks for hibernating bats between December and February.
- For buildings with high potential to support hibernation roosts or confirmed hibernation roosts, three checks for hibernating bats between December and February.

28 Froglife (1999). *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife Advice Sheet 10. Froglife, Halesworth
29 Collins (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

- For buildings with confirmed hibernation roosts or those assessed as having moderate or high potential to support hibernation roosts, three static monitoring deployments should be undertaken, each for a minimum of 14 days, between December and February.

6.2.5 Emergence surveys should start 15 minutes before sunset and end between 1.5 and 2 hours after sunset. Return to roost surveys should start 1.5 to 2 hours before sunrise and end 15 minutes after sunrise. Each survey visit should be spaced at least two weeks apart.

6.2.6 It should be noted that these are the minimum number of surveys required, and the level of survey of some buildings may need to be increased if new roosts are recorded or if the surveys are unable to confidently determine the likely absence of roosts.

Table 6. Recommended further surveys for bats.

Building number	Potential to support roost type*				Recommended further survey
	D	M	H	N	
B1	L	N	H	N	One emergence or return to roost survey between May and August, inclusive. Due to safety concerns it is considered unlikely that it will be possible to check the underground structure for the presence of hibernating bats. However, it should be possible to deploy a static monitoring device within the underground structure for a minimum of two weeks in each month from December to February.
B2	L	N	L	N	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B3	L	N	L	N	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B5	M	L	L	N	One emergence and one return to roost survey between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B6	L	L	L	N	One emergence or one return to roost survey undertaken during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B7	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.
B8	M	N	C	L	One emergence and one return to roost survey between May and August (inclusive). Three checks for hibernating bats between December and February and the deployment of a static monitoring device within the interior of the building for a minimum of two weeks in each month from December to February.
B11	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.
B14	L	N	L	L	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B15	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.

Building number	Potential to support roost type*				Recommended further survey
	D	M	H	N	
B16	C	M	L	N	Three survey visits between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). The three survey visits should comprise a mixture of emergence and return to roost surveys. Two checks for hibernating bats between December and February, ideally one in mid-January and one in mid-February.
B17	M	N	L	C	Three survey visits between May and August (inclusive) comprising a mixture of emergence and return to roost surveys. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B18	N	N	M	N	Two checks for hibernating bats between December and February, ideally one in mid-January and one in mid-February. and the deployment of a static monitoring device within the interior of the building for a minimum of two weeks in each month from December to February.
B22	L	N	L	L	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B25	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.
B27	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.
B28	M	L	L	N	One emergence and one return to roost survey between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B29	M	M	L	N	One emergence and one return to roost survey between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B33	C	N	C	L	Three survey visits between May and August (inclusive) comprising a mixture of emergence and return to roost surveys. Three checks for hibernating bats between December and February and the deployment of a static monitoring device within the underground structure for a minimum of two weeks in each month from December to February.
B34	L	N	L	N	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B39	L	N	M	L	One emergence or return to roost survey between May and August, inclusive. Two checks for the presence of hibernating bats between December and February, inclusive.
B40	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.

Building number	Potential to support roost type*				Recommended further survey
	D	M	H	N	
B41	C	L	L	N	Three survey visits between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). The three survey visits should comprise a mixture of emergence and return to roost surveys. Two checks for hibernating bats within the roof void between December and February, ideally one in mid-January and one in mid-February.
B43	H	M	L	N	Three survey visits between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). The three survey visits should comprise a mixture of emergence and return to roost surveys. Two checks for hibernating bats within the roof void between December and February, ideally one in mid-January and one in mid-February.
B44	L	L	N	N	One emergence or return to roost survey during June or July (to coincide with the bat maternity season).
B45	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.
B46	L	L	L	L	One emergence or return to roost survey during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B47	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.
B50	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.
B52	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.
B53	M	L	L	N	One emergence and one return to roost survey between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B54	C	L	L	N	Three survey visits between May and August (inclusive) with at least one of the visits undertaken during June or July (to coincide with the bat maternity season). The three survey visits should comprise a mixture of emergence and return to roost surveys. Two checks for hibernating bats within the roof void between December and February, ideally one in mid-January and one in mid-February.
B56	L	N	L	N	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B61	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.
B62	L	N	L	N	One emergence or return to roost survey between May and August, inclusive. It is not considered possible to comprehensively check suitable features within this building for hibernating bats.
B63	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.

Building number	Potential to support roost type*				Recommended further survey
	D	M	H	N	
B64	L	N	N	N	One emergence or return to roost survey between May and August, inclusive.
B66	L	N	N	L	One emergence or return to roost survey between May and August, inclusive.

* D = day / transitional roost | M = maternity roost | H = hibernation roost | N = night / feeding roost
C= confirmed roost | H = high potential to support roost | M= moderate potential to support roost | L = low potential to support roost | N = negligible potential to support roost

6.3 Barn owl

6.3.1 In the first instance, access should be sought to undertake detailed inspections of buildings B14, B15, B21, B22, B23, B37, B38, B46 and B47), as access restrictions were a significant limitation to the inspection of these buildings.

6.3.2 A nest verification survey should also be conducted to check for the presence of breeding sites within buildings B11 and B52. This should comprise checking for the presence of adult barn owls, their moulted features, pellets, egg shells, chicks or down, which, due to the height of potential nesting features within these buildings will require the use of a mobile elevated working platform. Should it not be considered safe to conduct this type of survey, then alternatively a suite of observations surveys should be conducted at dusk and dawn. Nest verification surveys are best undertaken during the breeding season (between mid-June and early August), although visual checks can also be conducted during late autumn and the winter months. All surveys should follow standard protocol[30].

6.3.3 It is also recommended that all trees within the site should be checked for the presence of suitable features to support roosting and nesting barn owls.

30 Shawyer (2011) *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting*. IEEM, Winchester.

7. Conclusion

7.1.1 The results of the surveys indicate the presence of a transitory individual or a low population of common lizards within the south-western section of the site, the presence of bat roosts in six buildings and the presence of barn owl roosts in three buildings. The results of the surveys also indicate that there the potential for bat roosts to be present in a further 32 buildings and for barn owls to breed within two buildings within the site.

7.1.2 Further survey is required to determine the presence or likely absence of reptiles in areas of suitable habitat within the site that could not be surveyed in 2017. It is also recommended that full access is sought to inspect buildings where access restrictions were a significant limitation to the building inspection for bats and barn owls.

7.1.3 Further surveys are also required to characterise the confirmed bat roosts and to determine the presence or likely absence of roosts from buildings assessed as having the potential to support roosting bats. A nest verification survey is required to check for the presence of barn owl breeding sites within buildings B11 and B52 and it is also recommended that all trees within the site boundary should be checked for the presence of suitable features to support roosting bats, and roosting / nesting barn owls.

Appendix A | Figures

Figure 1.

Site location

Legend

Site boundary

Date of survey	N/A		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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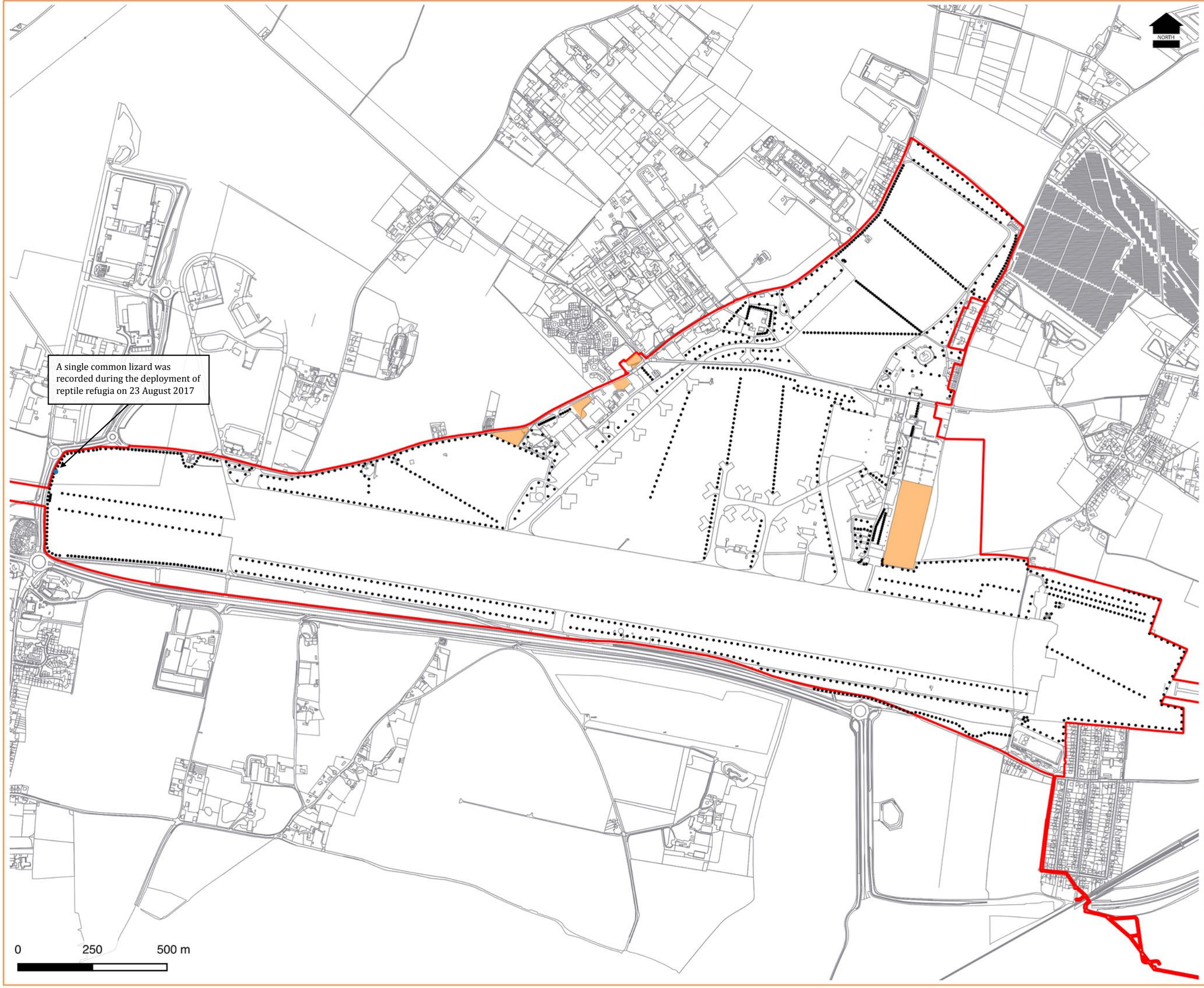

Figure 2.

Results of the reptile survey

Legend

Site boundary

Results of the reptile survey

- Common lizard
- Location of reptile refugia

Limitations

Areas of suitable reptile habitat not surveyed

Date of survey	7 Sept to 29 Sept 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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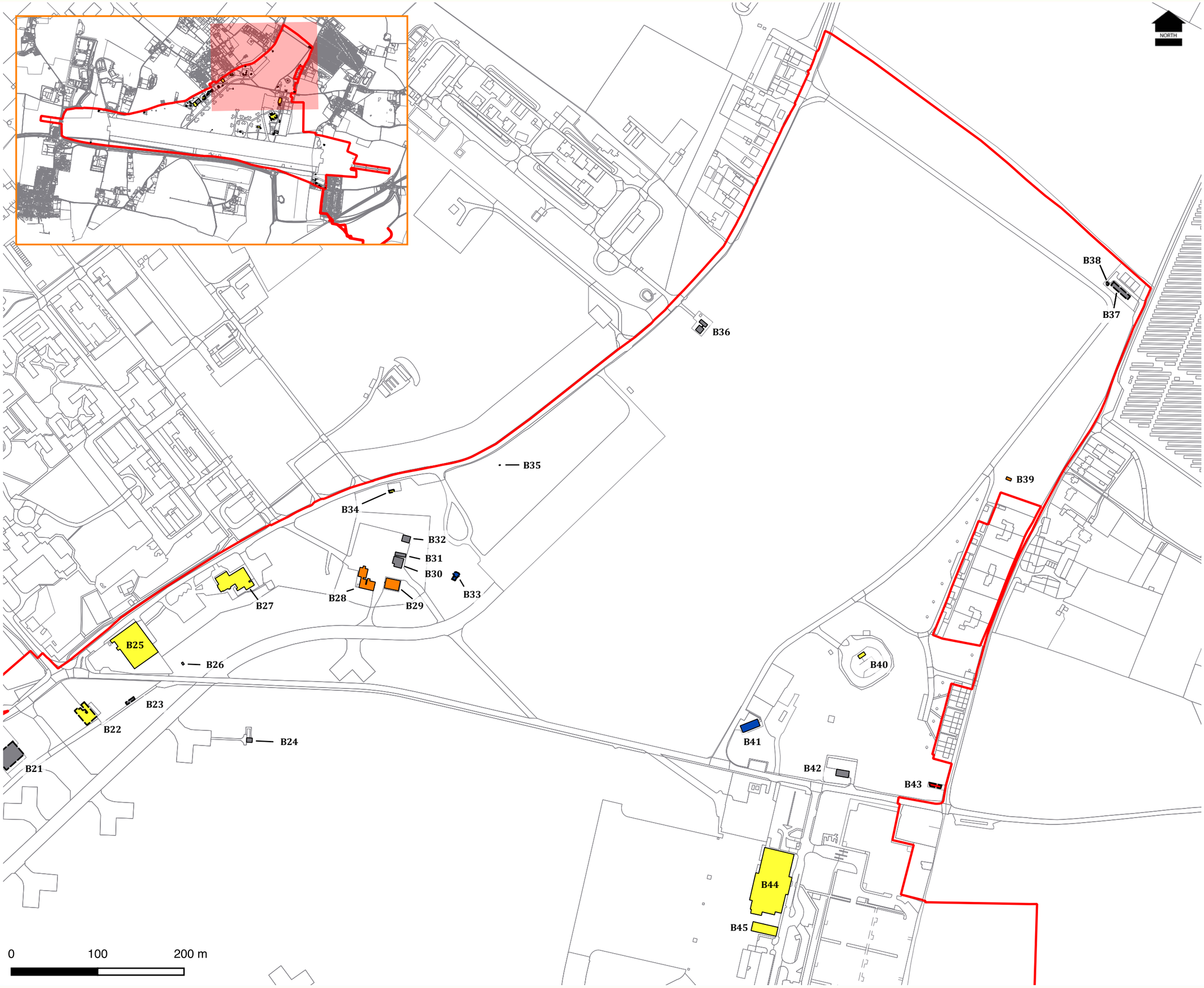

Figure 3a.

Results of the building inspection for bats

Legend

Site boundary

Potential of buildings to support roosting bats

- Confirmed roost
- High
- Moderate
- Low
- Negligible

Significant limitation to inspection

- Significant limitation

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
Checked by	TB
Status	FINAL

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Figure 3b.

Results of the building inspection for bats

Legend

Site boundary

Potential of buildings to support roosting bats

- Confirmed roost
- High
- Moderate
- Low
- Negligible

Significant limitation to inspection

- Significant limitation

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
Checked by	TB
Status	FINAL

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Figure 3c.

Results of the building inspection for bats

Legend

Site boundary

Potential of buildings to support roosting bats

- Confirmed roost
- High
- Moderate
- Low
- Negligible

Significant limitation to inspection

- Significant limitation

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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Figure 3d.

Results of the building inspection for bats

Legend

Site boundary

Potential of buildings to support roosting bats

- Confirmed roost
- High
- Moderate
- Low
- Negligible

Significant limitation to inspection

- Significant limitation

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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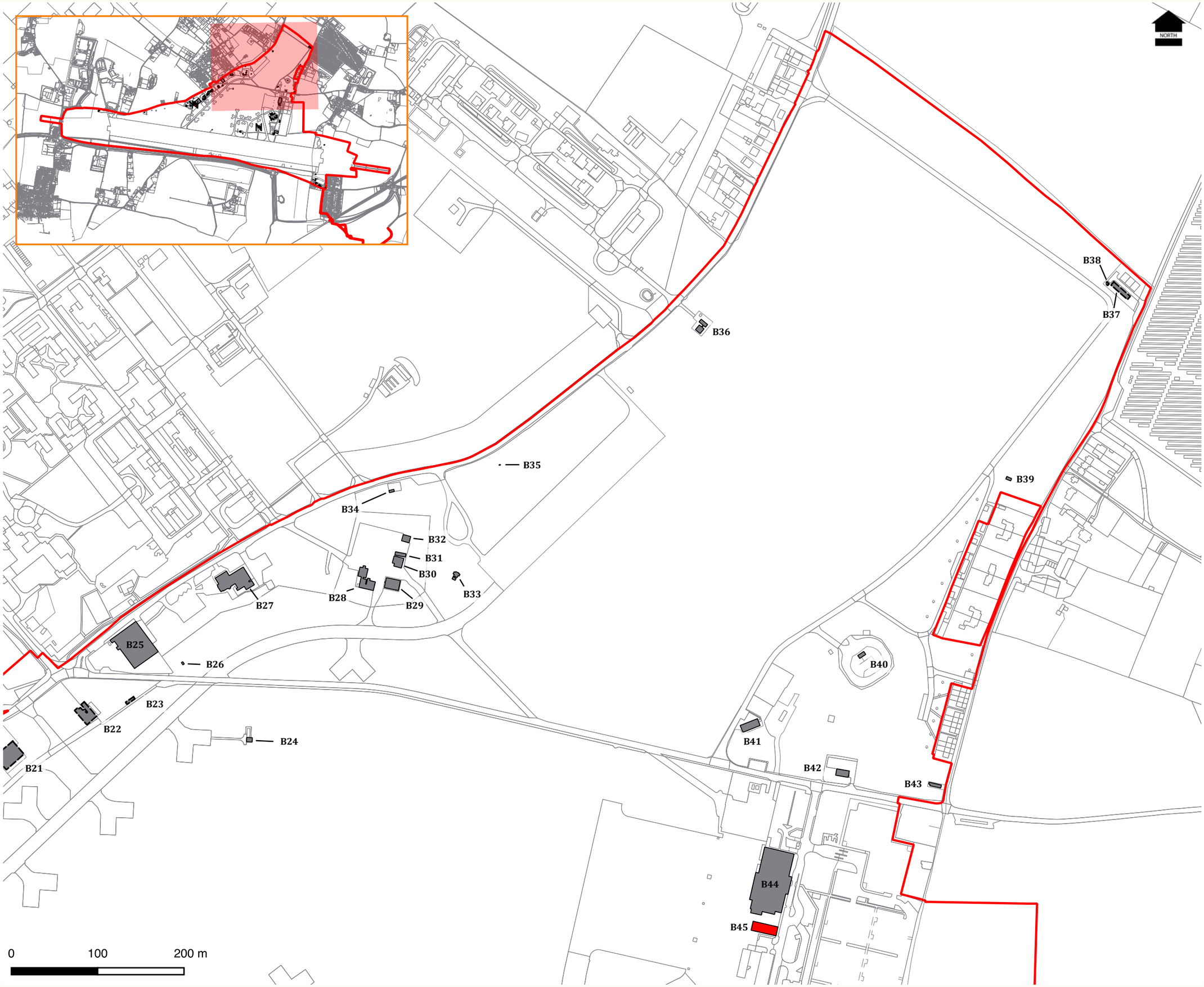

Figure 4a.

Results of the building inspection for barn owls

Legend

Site boundary

Potential of buildings to support barn owls

Confirmed roost

N Potential for nesting

Negligible potential for roosting / nesting

Significant limitation to inspection

Significant limitation

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
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Figure 4b.

Results of the building inspection for barn owls

Legend

Site boundary

Potential of buildings to support barn owls

- Confirmed roost
- N — Potential for nesting
- Negligible potential for roosting / nesting

Significant limitation to inspection

- Significant limitation

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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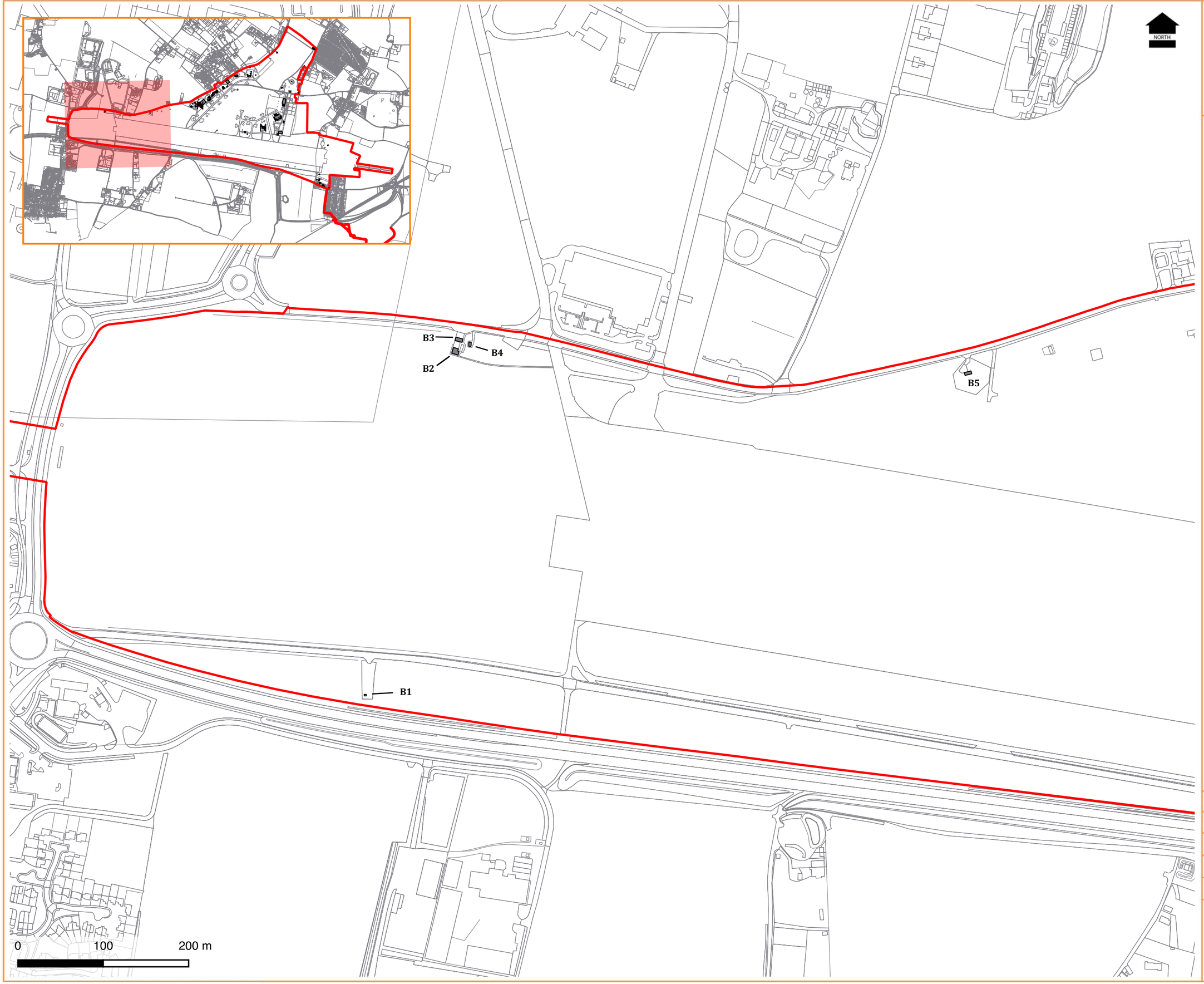

Figure 4c.

Results of the building inspection for barn owls

Legend

Site boundary

Potential of buildings to support barn owls

Confirmed roost

N Potential for nesting

Negligible potential for roosting / nesting

Significant limitation to inspection

Significant limitation

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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Figure 4d.

Results of the building inspection for barn owls

Legend

Site boundary

Potential of buildings to support barn owls

Confirmed roost

N Potential for nesting

Negligible potential for roosting / nesting

Significant limitation to inspection

Significant limitation

B54 B55 B56 B57 B58 B59 B60 B61 B62 B63 B64 B65 B66 B67 B68 B69 B70 B71

NORTH

0 100 200 m

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
Checked by	TB
Status	FINAL

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Figure 5a.

Photographs of buildings

Photo 1. Building B1

Photo 2. View into underground section of Building B1

Photo 3. Buildings B2, B3 and B4

Photo 4. Building B5

Photo 5. Building B6

Photo 6. Building B7

Photo 7. Building B8

Photo 8. Interior of Building B8

Photo 9. Building B9

Photo 10. Building B10

Photo 11. Building B11

Photo 12. Interior of Building B11

Photo 13. Building B12

Photo 14. Building B13

Photo 15. Building B14

Photo 16. Building B15

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Job reference	AFW104		
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Figure 5b.

Photographs of buildings

Photo 1. Building B16

Photo 2. Roof void of Building B16

Photo 3. Building B17

Photo 4. Interior of Building B17

Photo 5. Building B18

Photo 6. Interior of Building B18

Photo 7. Building B19

Photo 8. Building B20

Photo 9. Building B21

Photo 10. Building B22

Photo 11. Building B23

Photo 12. Building B24

Photo 13. Building B25

Photo 14. Building B26

Photo 15. Building B27

Photo 16. Building B28

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
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Figure 5c.

Photographs of buildings

Photo 1. Building B29

Photo 2. Building B30

Photo 3. Building B31

Photo 4. Building B32

Photo 5. Building B33

Photo 6. Interior of Building B33

Photo 7. Building B34

Photo 8. Building B35

Photo 9. Building B36

Photo 10. Buildings B37 and B38

Photo 11. Building B39

Photo 12. Interior of Building B39

Photo 13. Building B40

Photo 14. Building B41

Photo 15. Roof void of Building B41

Photo 16. Building B42

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
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Status	FINAL

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Figure 5d.

Photographs of buildings

Photo 1. Building B43

Photo 2. Building B44

Photo 3. Building B45

Photo 4. Interior of Building B45

Photo 5. Building B46

Photo 6. Building B47

Photo 7. Building B48

Photo 8. Building B49

Photo 9. Building B50

Photo 10. Building B51

Photo 11. Building B52

Photo 12. Interior of Building B52

Photo 13. Building B53

Photo 14. Building B54

Photo 15. Roof void of Building B54

Photo 16. Building B55

Date of survey	21 Aug to 17 Oct 2017		
Date of issue	17 November 2017		
Job reference	AFW104		
Drawn by	JB	Checked by	TB
Status	FINAL		

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Figure 5e.

Photographs of buildings

Photo 1. Building B56

Photo 2. Building B57

Photo 3. Building B58

Photo 4. Building B59

Photo 5. Building B60

Photo 6. Building B61

Photo 7. Building B62

Photo 8. Building B63

Photo 9. Building B64

Photo 10. Building B65

Photo 11. Building B66

Photo 12. Buildings B67 and B68

Photo 13. Building B69

Photo 14. Building B70

Photo 15. Building B71

Date of survey	21 Aug to 17 Oct 2017
Date of issue	17 November 2017
Job reference	AFW104
Drawn by	JB
Checked by	TB
Status	FINAL

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Appendix B | Dates of reptile checks and weather conditions

Visit no.	Date	Time		Temp (˚C)		Humidity (%)		Rain	Wind speed*	Cloud cover (oktas)	Comment	Overall suitability for reptile survey
		Start	End	Min	Max	Min	Max					
1	07/09/17	07:10	11:15	11.6	18.0	59	88	None	2	2-6	Overcast for first 40 minutes, then sunny until the end of the survey.	Optimal
2	15/09/17	08:15	13:15	9.5	16.0	52	89	None	2	3-4	Intermittent sunshine throughout survey.	Optimal
3	18/09/17	9:20	12:50	12.3	15.9	66	86	None	2	5-8	Overcast for first hour, then intermittent sunshine until the end of the survey. Occasional gusts of wind to BF4.	Optimal
4	22/09/17	11:25	14:45	15.1	17.0	55	68	None	2	1-3	Sunny with a light breeze.	Optimal
5	25/09/17	9:30	14:00	17.1	18.3	65	73	None	3	4-7	Intermittent sunshine with a gentle breeze.	Suitable
6	27/09/17	8:30	11:45	15.1	17.5	70	81	None	2-3	4-8	Initially overcast, slowly clearing to sunny intervals.	Optimal
7	29/09/17	7:10	10:00	16.4	18.2	85	96	+	3	5-7	Gentle breeze with occasional sunshine.	Suitable

* Measured on the beaufort scale

+ Brief rain shower 20 minutes into survey

Appendix C | Building numbers, dates of building inspections and limitations

Building number	WSP | PB building number	Date of building inspection		Limitations of bat inspection		Limitations of barn owl inspection	
		External	Internal	Detail	Considered significant? (Y, N, N/A)	Detail	Considered significant? (Y, N, N/A)
B1	-	10/10/17	-	The underground structure could not be accessed due to safety concerns.	Y	The underground structure could not be accessed due to safety concerns. However, the underground structure is considered unlikely to provide suitable roosting or nesting opportunities for barn owls, and therefore this is not considered to be a significant limitation.	N
B2	B56a	10/10/17	-	It was not possible to access the interior of the building due to the presence of high voltage equipment, although as no roof void is present this is not considered to be a significant limitation.	N	It was not possible to access the interior of the building due to the presence of high voltage equipment, although as no access points were recorded this is not considered to be a significant limitation.	N
B3	B56b	10/10/17	-	It was not possible to access the interior of the building due to the presence of high voltage equipment, although as no roof void is present this is not considered to be a significant limitation.	N	It was not possible to access the interior of the building due to the presence of high voltage equipment, although as no access points were recorded this is not considered to be a significant limitation.	N
B4	B56c	10/10/17	10/10/17	None	N/A	None	N/A
B5	B69	10/10/17	-	It was not possible to access the interior of the building due to access restrictions.	Y	It was not possible to access the interior of the building due to access restrictions. However, as no access points were recorded this is not considered to be a significant limitation.	N
B6	B16	04/10/17	-	None. An internal inspection was not considered necessary due to the absence of a roof void.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B7	B17	04/10/17	-	None. An internal inspection was not considered necessary due to the absence of a roof void.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B8	B32	04/10/17	05/10/17	None	N/A	None	N/A
B9	B4	04/10/17	-	It was not possible to access the interior of the building due to access restrictions. However, this is not considered to be a significant limitation as no roof void is present and the thermal properties of the building are likely to be unsuitable for roosting bats.	N	It was not possible to access the interior of the building due to access restrictions. However, as no access points were recorded this is not considered to be a significant limitation.	N
B10	B63	04/10/17	-	None. An internal inspection was not considered necessary as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B11	B3	04/10/17	04/10/17	The presence of large quantities of pigeon droppings and feathers made searching for evidence of bats within the building problematic. However, this is not considered to be a significant limitation.	N	Due to the height of the building, it was not possible to search of evidence of barn owl nests above the ventilation housing.	Y
B12	B2b	04/10/17	04/10/17	None	N/A	None	N/A
B13	B62	04/10/17	-	None. An internal inspection was not considered necessary as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B14	B2a	04/10/17	-	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. It was not possible to undertake an internal inspection of the building.	Y	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. It was not possible to access the interior of the building.	Y
B15	B65	04/10/17	-	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. No internal inspection could be undertaken and it was not possible to view the northern elevation of the building.	Y	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. No internal inspection could be undertaken and it was not possible to view the northern elevation of the building.	Y
B16	B23	04/10/17	05/10/17	None	N/A	None	N/A

Building number	WSP | PB building number	Date of building inspection		Limitations of bat inspection		Limitations of barn owl inspection	
		External	Internal	Detail	Considered significant? (Y, N, N/A)	Detail	Considered significant? (Y, N, N/A)
B17	B21	05/10/17	05/10/17	There was no internal access to the extension on the northern elevation. However, given the small size of this section of the building, this is not considered to be a significant limitation.	N	None	N/A
B18	B61	05/10/17	05/10/17	None	N/A	None	N/A
B19	B34	05/10/17	05/10/17	None	N/A	None	N/A
B20	B18b	05/10/17	05/10/17	None	N/A	None	N/A
B21	B18a	05/10/17	-	Due to access restrictions, it was not possible to undertake an internal inspection of the building and there was a limited view of the northern and eastern elevations of the building.	Y	Due to access restrictions, it was not possible to undertake an internal inspection of the building and there was a limited view of the northern and eastern elevations of the building.	Y
B22	B25	05/10/17	-	Due to access restrictions, it was not possible to undertake an internal inspection of the building, and there was a limited view of the northern and eastern elevations during the external inspection	Y	Due to access restrictions, it was not possible to undertake an internal inspection of the building, and there was a limited view of the northern and eastern elevations during the external inspection.	Y
B23	-	10/10/17	-	Due to access restrictions, it was only possible to undertake an external inspection of the south-eastern elevation of this building.	Y	Due to access restrictions, it was only possible to undertake an external inspection of the south-eastern elevation of this building.	Y
B24	B35	09/10/17	09/10/17	None	N/A	None	N/A
B25	B24	05/10/17	05/10/17	None	N/A	None	N/A
B26	B64	10/10/17	-	None. An internal inspection was not considered necessary as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B27	B27	05/10/17	05/10/17	None	N/A	None	N/A
B28	B14a, B14b	09/10/17	-	None. It was not considered necessary to inspect the interior of the building as no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B29	B20	09/10/17	09/10/17	None	N/A	None	N/A
B30	B19b	09/10/17	-	None. An internal inspection was not considered necessary as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B31	B19a	09/10/17	09/10/17	None	N/A	None	N/A
B32	B22	09/10/17	-	Due to access restrictions, it was not possible to access the interior of the building. However, as no potential access points were recorded, this is not considered to be a significant limitation.	N	It was not possible to access the interior of the building due to access restrictions. However, as no access points were recorded this is not considered to be a significant limitation.	N
B33	B36	09/10/17	09/10/17	Access to the above ground tower was not possible due to safety concerns.	Y	Access to the above ground tower was not possible due to safety concerns. However, this part of the structure is considered unlikely to provide suitable roosting or nesting opportunities for barn owls, and therefore this is not considered to be a significant limitation.	N
B34	B37	10/10/17	-	It was not possible to access the interior of the building due to safety concerns.	Y	It was not possible to access the interior of the building due to safety concerns. However, as no access points were recorded this is not considered to be a significant limitation.	N
B35	B38	10/10/17	10/10/17	None	N/A	None	N/A
B36	B39	10/10/17	-	None. It was not considered necessary to inspect the interior of the building as no access points were identified and no roof void is present.	N/A	None. An internal inspection of the adjoining building was not considered necessary due to the absence of suitable access points.	N/A

Building number	WSP | PB building number	Date of building inspection		Limitations of bat inspection		Limitations of barn owl inspection	
		External	Internal	Detail	Considered significant? (Y, N, N/A)	Detail	Considered significant? (Y, N, N/A)
B37	B40	10/10/17	-	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. No internal inspection could be undertaken and it was not possible to view the northern or western elevations of the building.	Y	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. No internal inspection could be undertaken and it was not possible to view the northern or western elevations of the building.	Y
B38	-	10/10/17	-	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. As such, it was only possible to view the eastern elevation of the building. No internal inspection could be undertaken.	Y	Due to access restrictions, it was only possible to conduct an external inspection of the building from outside a security fence. As such, it was only possible to view the eastern elevation of the building. No internal inspection could be undertaken.	Y
B39	B41	10/10/17	10/10/17	None	N/A	None	N/A
B40	B13	10/10/17	10/10/17	None	N/A	None	N/A
B41	B31	09/10/17	09/10/17	None	N/A	None	N/A
B42	B26	10/10/17	-	None. It was not considered necessary to inspect the interior of the building as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B43	B43	10/10/17	-	Due to access restrictions, it was not possible to undertake an internal inspection of the building.	Y	Due to access restrictions, it was not possible to undertake an internal inspection of the building. However, as no access points were recorded this is not considered to be a significant limitation.	N
B44	B6	14/09/17	-	It was not possible to access the roof void within the pitched roof section of the building due to the presence of a hanging ceiling. However, due to the thermal properties of this section of the building, the roof void is considered unlikely to provide potential roosting opportunities for bats and therefore this is not considered to be a significant limitation.	N	It was not possible to access the roof void within the pitched roof section of the building due to the presence of a hanging ceiling. However, as no access points were recorded this is not considered to be a significant limitation.	N
B45	B12	14/09/17	14/09/17	None	N/A	None	N/A
B46	B1	09/10/17	-	Due to access restrictions, it was not possible to access the interior of the building, and there was only limited access to the exterior of the building.	Y	Due to access restrictions, it was not possible to access the interior of the building, and there was only limited access to the exterior of the building.	Y
B47	B45	09/10/17	-	Due to access restrictions, it was not possible to access the interior of the building and there was only limited access to the exterior of the building. It was not possible to view the northern elevation of the building.	Y	Due to access restrictions, it was not possible to access the interior of the building and there was only limited access to the exterior of the building. It was not possible to view the northern elevation of the building.	Y
B48	B10	14/09/17	-	None. It was not considered necessary to inspect the interior of the building as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B49	B52	21/08/17	-	None. It was not considered necessary to inspect the interior of the building as no access points were identified and no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B50	B9	21/08/17	-	None. It was not considered necessary to inspect the interior of the building as no roof void is present.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B51	B48	21/08/17	-	None. It was not considered necessary to inspect the interior of the building as no potential access points for bats were recorded.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B52	B8	21/08/17	21/08/17	The presence of large quantities of pigeon droppings and feathers made searching for evidence of bats problematic, although this is not considered to be a significant limitation.	N	Due to the height of the building, it was not possible to search of evidence of barn owl nests.	Y
B53	B47	21/08/17	21/08/17	There was no access to the roof void, as no loft hatch is present.	Y	There was no access to the roof void, as no loft hatch is present. However, as no access points were recorded this is not considered to be a significant limitation.	N

Building number	WSP | PB building number	Date of building inspection		Limitations of bat inspection		Limitations of barn owl inspection	
		External	Internal	Detail	Considered significant? (Y, N, N/A)	Detail	Considered significant? (Y, N, N/A)
B54	B46	14/09/17	14/09/17	None	N/A	None	N/A
B55	B30	14/09/17	09/10/17	None	N/A	None	N/A
B56	B49	10/10/17	-	It was not possible to inspect the interior of the building due to the presence of high voltage equipment.	Y	It was not possible to inspect the interior of the building due to the presence of high voltage equipment. However, as no access points were recorded this is not considered to be a significant limitation.	N
B57	-	10/10/17	-	It was not considered necessary to inspect the interior of the building as no potential access points for bats were recorded.	N/A	None. An internal inspection was not considered necessary due to the absence of suitable access points.	N/A
B58	B67	10/10/17	-	None	N/A	None	N/A
B59	-	17/10/17	17/10/17	None	N/A	None	N/A
B60	-	17/10/17	17/10/17	None	N/A	None	N/A
B61	-	17/10/17	-	It was not possible to access the roof void due to safety concerns.	Y	While it was not possible to access the roof void due to safety concerns, it was possible to view a sufficient amount of the roof void from ground level to determine a likely absence of potential roosting or nesting features.	N
B62	-	17/10/17	17/10/17	None	N/A	None	N/A
B63	-	17/10/17	17/10/17	None	N/A	None	N/A
B64	-	17/10/17	17/10/17	None	N/A	None	N/A
B65	-	17/10/17	17/10/17	None	N/A	None	N/A
B66	-	17/10/17	17/10/17	None	N/A	None	N/A
B67	-	17/10/17	-	None	N/A	None	N/A
B68	-	17/10/17	-	None	N/A	None	N/A
B69	-	17/10/17	17/10/17	None	N/A	None	N/A
B70	-	17/10/17	17/10/17	None	N/A	None	N/A
B71	-	17/10/17	17/10/17	None	N/A	None	N/A

Appendix 7.7

Technical note:
Manston Airport DCO EIA: Invertebrate scoping survey 2017

1. Introduction

RiverOak Strategic Partners (RIVEROAK) is planning to reopen Manston Airport as a new air freight and cargo hub for the South East. This site is located within the district of Thanet in the county of Kent, close to the coastal town of Margate (the approximate central point of the site is at National Grid Reference [NGR] TR 330 657).

There was an operational airport at the site between 1916 and 2014. Until 1998 it was operated by the Royal Air Force as RAF Manston, and, for a period in the 1950s, was also a base for the United States Air Force (USAF). From 1998 it was operated as a private commercial airport with a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing; in the most recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014 much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal remain intact.

The proposed Manston Airport development involves the development of an air freight and cargo facility with the capacity to handle more than 10,000 air transport movements (ATMs) of cargo aircraft per year as part of the provision of air cargo transport services.

This technical note details the results of a scoping assessment to identify the potential of the proposed development Site for terrestrial invertebrates.

2. Methods

The site was assessed on the 22nd of August 2017, between 09.00 and 17.00. The weather was moderately warm but continuously overcast and humid. An initial overview of the site from a car was followed by a walkover survey which took a meandering route through the grassland and visited enclosed and marginal features of potential interest as invertebrate habitats. Invertebrates were sampled by sweep-netting. Any conspicuous species identifiable without capture, such as butterflies and bumblebees, were also noted, and opportunity was occasionally taken to search for individual species of interest when apparently suitable habitat was encountered. This report provides an assessment of the invertebrate potential of the site, lists and briefly assesses the invertebrates recorded, and proposes further work to establish the character and level of interest of the invertebrate fauna. It is based almost entirely on observations made on the day of survey, but historical images on Google Earth have been used to provide background information

2.1 Limitations

The survey was undertaken late in the year, after the grassland which occupies most of the site had been cut, but sufficiently late for there to have been considerable re-growth. Such re-growth cannot give an accurate impression of the character of the grassland in spring and early summer, and although allowance is made for this in the assessment, some uncertainty as to its potential must remain. In uncut areas, many plants had long finished flowering, and though it was possible to gain a good impression of the floristic

composition of such areas, it was not possible to form a reliable impression of, for example, the scale of the spring nectar resource they offer, which might profoundly affect the spring bee fauna. Sampling of invertebrates was inevitably somewhat superficial. The list obtained is quite short, and its composition reflects ease of capture more than any other attribute. The visit was made late in the season for invertebrates, and many species and groups with peaks of activity in the spring and early summer are necessarily absent from the list. Overcast conditions throughout the survey meant that some groups which might have been informative, notably late-flying bees and wasps, were found only in small numbers.

3. Results

3.1 Assessment of habitats and invertebrate potential

Introduction

Most of the site is of very simple character: mown grassland on level ground or very gentle slopes, and hard surfaces provided by the runway, roadways and parking areas. Of the hard surfacing, the runway is overwhelmingly the most substantial and the most varied in terms of the habitats it provides. There are additional, and quite varied, habitats around the site periphery, including areas of brownfield character on cleared ground and rubble and around unused buildings, uncut grassland, a bank supporting tall ruderal vegetation, tall vegetation along the boundary fence, stretches of hedge and some trees. The largest single area of such additional habitat is associated with the site of a former car park, and could not be visited for the scoping survey but was seen through its boundary fence. For current purposes, and for the planning of further survey work, it is convenient to divide the site into four: the mown grassland; the runway and its margins; the former car park and associated habitats; and additional features, including all hard surfaces and their margins within the grassland, other than the runway, as well as peripheral features.

The grassland

Semi-improved grassland of rather uniform structure and management occupies most of the site, and is managed by mowing. In 2017, it appeared to have been cut in July, and was showing considerable re-growth by the time of the scoping survey. Limited invertebrate potential would normally be expected of grassland fitting this description. Two factors may raise the potential in this case: the area involved is very large, so species reduced to low density by the management regime may still have viable populations; and the cut is high, to maintain a sward length which will discourage birds, thereby maintaining more habitat through the cut than would be the case in conventional cutting. Cuts of this type are rare, and the way in which the invertebrate fauna is affected is not known. Simple logic would suggest that the impact would be considerable, but less than that of a conventional low cut, and that invertebrate interest might therefore be higher than in a conventional hay meadow.

The re-growth included good flowering populations of a number of plants, but the character of the grassland cannot be fully determined by post-cut assessment alone. It is noteworthy that an earlier Phase 1 survey (June 2015[1]) identified areas of relatively species-rich grassland at the east and west ends of the runway; assessment in August 2017 would tend to place the richest (though patchily variable) grassland towards the centre. It seems rather likely that survey in spring would give a different impression.

The grassland was fairly uniform in height and formed an almost continuous sward, except in areas of very recent disturbance. It may be less uniform, at least in height, before cutting. Some areas were also relatively uniform in composition, but elsewhere there was considerable variation in detail, and the degree of patchiness was noteworthy. Some of the variation was at a fairly large scale: thus, for example, bird's-foot trefoil was abundant in one substantial area, but almost absent from much of the grassland; and burnet saxifrage, generally at most a scarce component, was abundant over one broad band to the extent of being dominant over areas of several square metres. More widely, single species of flowering plants tended to be abundant or to dominate over areas measurable in square metres but be virtually absent from the

[1] WSP| PB. April 2016. Stone Hill Park. Extended Phase 1 habitat Survey. Report 001 Project No: 70009799. OL-TH-016-0550. ES Vol II.

surrounding grassland. Some apparent absences from the plant list are interesting: neither common nor chalk knapweed were seen, though greater knapweed was present in very small quantity; and over most of the grassland there were no clovers.

In the areas of lowest potential, the sward consisted entirely of coarse grasses over a moderate thatch of dead material. Generally, the sward was more varied and somewhat more open-structured with only a thin covering of dead dry material. Bare ground, however, was scarce over most of the grassland. Recent archaeological excavations had locally increased the area of bare soil, but the excavations are too recent for invertebrates to have been likely to take full advantage, and the vegetation is closing rapidly.

The large populations of some important invertebrate foodplants should favour a varied phytophagous fauna. Structural uniformity may limit the fauna generally, however, and the shortage of very open-structured vegetation and bare ground, coupled with the limited topographical variation, is likely to restrict the range of ground-dwelling and ground-nesting fauna. The potential for the flower-associated fauna is uncertain; mowing will effectively rule out any interest in species associated for the whole of their life-history with the flowering parts of tall plants, but the high cut may retain shorter plants intact; the bee fauna will be affected by the limited availability of nesting sites for ground-nesting species, but also by the exact pattern of availability of nectar and pollen sources through the year.

The runway and its fringes

Though most of the runway is still tarmac with negligible potential for invertebrates, part is now vegetated, though quite thinly in places, and provides an unusual habitat of considerable area. Some of the vegetation is little more than well-separated flowering stems emerging directly from holes in the tarmac, but some mat-forming species, such as black medick, bird's-foot trefoil and white clover, have grown sufficiently to accumulate leaf litter and debris and to support dense colonies of woodlice and other invertebrates.

A narrow fringe of vegetation along the edge of the runway varies in detail but is always very different in character to that of the surrounding grassland. In places it is quite coarse, dominated by common mallow and yellow crucifers which reach to, and spread over, the edge of the tarmac. Elsewhere, the vegetation is shorter and finer, in places with bare ground and sometimes with a small but very definite slope at the runway fringe. Mats of vegetation, especially of stonecrops, spread out over the tarmac in places. Plants with good populations in this narrow fringe, but absent from, or very scarce in, the grassland include common stork's-bill, buck's-horn plantain and spiny restharrow, and more widespread plants such as yarrow grow here in more stressed conditions and provide better invertebrate habitat than elsewhere. Though the fringe is narrow, rarely more than a metre in width, the runway is so long that the total area of habitat is large. It is generally fairly abruptly distinct from the adjoining grassland, but in places the grassland is somewhat more herb-rich for a few metres beyond the runway boundary. The fringe provides sufficient habitat in itself for many species, and may also provide a nesting site for solitary bees and wasps which forage more widely in the grassland.

The car park and associated habitats

The former car park and its associated habitats could not be visited for the scoping survey, so this opinion of its character and potential is based solely on views from the boundary.

Habitats within this area are quite varied, but are dominated in the north by the tarmac surfacing of the car park, assumed to be of negligible potential, and in the south by a grass-scrub mosaic. This mosaic has developed on former arable land, taken out of cultivation somewhere between 2003 and 2007, and seemingly then allowed to colonise naturally, though an apparent decline in scrub density between 2009 and 2013 suggests at least occasional management. Structurally, the mosaic appears to be of high potential, with a mix of bare and sparsely vegetated ground, taller grassy vegetation and scattered invasive scrub. This state, though usually transitory in unmanaged habitats, is often associated with high invertebrate diversity and interest. However, the details of vegetation composition and substrate character, and the extent of bare ground, could not be determined, except for a very limited area close to the fence-line, so it is possible that this general impression over-estimates the area's potential. The remaining habitats within this can probably

all eventually be added to the “additional features” category, and include trees, small areas of grassland, and narrow vegetated fringes beside hard substrates. Varied structure, absence of recent management, rabbit activity, and a moderately rich flora suggest the likelihood of some invertebrate interest in these areas.

Additional features

Additional habitat features are varied in character and occupy a small proportion of the site. Individually, few have the potential to be of high interest, but collectively they may add many species to the overall site list, including species with formal status, and they may be important in providing nesting sites for species which forage in the mown grassland. Some noteworthy features can be identified.

- Tall ruderal vegetation along the perimeter fence. This was noteworthy at the time of the scoping survey for an abundance of tall yellow crucifers and local stands of Alexanders. Though this vegetation occupies only a thin band along the site margin, the perimeter is long and the total habitat area large. This vegetation may be important not only for crucifer-feeding species, for example, but also for flower-visiting species breeding elsewhere, for stem-nesting bees and wasps, and as a hibernation site and refugium for species breeding in the grassland.
- The tall earth bank immediately south of Manston Road. This appears to be composed of nutrient-rich soil and supports coarse ruderal vegetation, and as such its potential is limited. However, it supports, for example, a large population of annual mercury, the foodplant of the nationally scarce seed weevil *Kalcapion semivittatum*.
- Uncut grassland north of the runway towards the eastern end of the site. This uncut area is not of especially high quality, and is noteworthy for the abundance of ragwort. However, the absence of cutting enables it to support species absent from the wider area of mown grassland.
- Disturbed ground, banks and rubble south of the Avman buildings. This is a very interesting area, though small in the context of the site overall. Bare ground on well-drained substrates, earth banks, varied vegetation structure and a range of nectar plants make this potentially very useful as a nesting and foraging areas for solitary bees and wasps, many of which may range more widely over the grassland.
- The margins of roads, tracks and other hard-standing within the mown grassland. This is a rather widespread and scattered category, though of fairly uniform character. The highest potential appears to be along the track to the south of the main runway, especially in its western half, which in places has similar character to the habitats along the runway margin. Other hard surfaces tend to have a rather more abrupt margin with little distinction from the surrounding grassland, and many are managed to their edges. A visit after the summer cut may have exaggerated the uniformity, however.
- Peripheral hedges and trees. There are recently planted mixed hedges, older hedges, and a number of trees at various points around the site periphery. None of those seen is of a character likely to support substantial invertebrate interest. Some uncommon species could be present and they are likely collectively to support many species not found elsewhere, but they are considered a relatively trivial feature.

Other, often very small, features include patches of tall uncut vegetation around buildings; small patches of vegetation on broken concrete or other artificial substrates; mats of vegetation over tarmac tracks, and scattered plants growing through cracks in tarmac or concrete. The floristic composition of such areas can be very different from that of the grassland, and the vegetation structure more open and more varied.

3.2 Invertebrate records

A total of 169 invertebrate species was recorded during the survey, of which nineteen have a formal (red data book or nationally scarce) conservation status and two are new to Britain. Appendix 1 gives definitions of the formal conservation statuses; Appendix 2 provides short accounts for red data book and nationally scarce species, and appendix 3 is a complete list of species recorded. These are listed under three broad area/habitat categories: the grassland, the runway and its margins; and peripheral habitats.

The sample of invertebrates taken is too small and too selective to provide a basis for even a preliminary assessment of interest, but is sufficient to demonstrate that such interest is not negligible. The fact that species with formal conservation status comprise more than 10% of the recorded fauna suggests high species quality, but in practice a large proportion of these species are in groups which have not been recently reviewed and the formal status of some is open to doubt. The accounts in Appendix 2 provide more details. Kent is, anyway, rather rich in species with formal conservation status simply because of its geographical location, and relatively ordinary places can support multiple nationally scarce species.

None of the species with formal status is very unexpected for the area or the habitats. Nonetheless, they are collectively informative. Unsurprisingly, they are all associated with open habitats, but some are characteristic of very open and well-insolated habitats, and many are familiar components of rich assemblages on open calcareous habitats elsewhere in the south-east. Given the limited recording effort so far expended, it is very possible that these form the tip of a faunal iceberg of species with similar requirements. Considering that the survey was made late in the season and under poor conditions for bees and wasps, and that few of the group, in terms of either species or individuals, were encountered, the number of scarce aculeates with restricted distribution is impressive and suggests that this group might prove of substantial interest.

The populations of some of the scarcer species appeared to be large. The small heath, admittedly a species possessing formal status because it is declining rather than because it is, as yet, actually rare, was widespread in the grassland and was seen in large numbers despite the rather poor weather conditions; and the gall fly *Acanthiophilus helianthi*, a species usually found in very small numbers, was common in some areas. This is especially interesting because its usual foodplant, common knapweed, appears to be absent.

The two species new to Britain are both leafhoppers of the genus *Tettigometra*. Both are assumed to be recent colonists, and to have limited conservation significance. Newly arrived species of Hemiptera are recorded in Britain in most years, but these are somewhat unexpected, in that *Tettigometra* do not seem particularly mobile species, and do not appear to be spreading in mainland Europe. However, the facts that they are distinctive animals, that Kent is an historically well-studied county, and that they were found in close proximity to the tarmac of a former runway seems to rule out the possibility of them being overlooked long term natives and perhaps provide a hint as to their possible means of arrival.

3.3 Overall Assessment

The site is considered to have high potential for invertebrates of open habitats. Factors favouring high interest are:

- large area;
- favourable geographical location;
- long history of open conditions;
- high floristic diversity;
- large populations of some important invertebrate foodplants;
- varied structure, including bare and sparsely vegetated ground, managed grassland, and unmanaged or lightly managed tall herbs.

The managed grassland which comprises most of the habitat on the site is compromised in its potential by:

- uniform structure;
- limited topographical variation;
- limited area of bare ground;
- semi-improved character.

Though substantial invertebrate interest may be present, the expectation is that this will not prove exceptional, and some species, especially solitary bees and wasps, may be in part dependent on peripheral features and habitats, especially for nesting sites.

Diversity and interest are considered likely to be higher in other open habitats than in the mown grassland. Higher interest overall in these areas is favoured by:

- varied structure, including bare and sparsely vegetated ground, unmanaged tall herbs, and complex mosaics;
- varied substrates;
- locally varied topography;
- varied floristic composition, including good populations of a number of important foodplants not present, or rare, in the grassland.

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Author	Reviewer
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Management systems

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Appendix A
Status definitions and abbreviations

Each of the species recorded has been assigned a status. The better-known groups of invertebrates were assessed for formal conservation status in Red Data Books and National Reviews from the mid-1980s onwards, using criteria from the IUCN for the rarest (Red Data Book) species, and defining species believed to occur in 100 or fewer 10-kilometres squares of the National Grid as Notable (now known as Nationally Scarce). The earlier IUCN criteria have been superseded, but only a fraction of the fauna has as yet been assessed, in published reviews, under the newer criteria. The following formal statuses and abbreviations from the older system are used in this report:

Red Data Book category 3 – Rare (RDB3)

Taxa with small populations in Great Britain that are not at present Endangered or Vulnerable, but are at risk. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. Included are species which are estimated to exist in only fifteen or fewer hectads. This criterion may be relaxed where populations are likely to exist in over fifteen hectads but occupy small areas of especially vulnerable habitat.

Nationally Scarce category A (Na)

Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in 30 or fewer hectads of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.

Nationally Scarce category B (Nb)

Taxa which do not fall within RDB categories but which are nonetheless uncommon in Great Britain and are thought to occur in between 31 and 100 hectads of the National Grid or, for less-well recorded groups, between eight and twenty vice-counties.

Nationally Scarce (N)

For some less well-recorded groups and species, it has not been possible to determine which of the Nationally Scarce categories (A or B) is most appropriate for scarce species. These species have been assigned to an undivided Nationally Scarce category.

A single category from the new IUCN criteria is used in this report:

Lower Risk (LR)

A taxon is Lower Risk where it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the LR category can be separated into four subcategories, of which only one is relevant to the current survey.

Near Threatened (NT). Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable – in Britain, defined as occurring in 15 or fewer hectads but not CR, EN or VU.

Under the revised criteria, at the national level, countries are permitted to refine the definitions for the non-threatened categories and to define additional ones of their own. The Nationally Rare (NR) category is defined as species recorded from 15 or fewer hectads of the Ordnance Survey national grid in Great Britain. The Nationally Scarce (NS) category is defined in the same way but the species is recorded from between 16 and 100 hectads since 1980. These correspond respectively to the former Red Data Book Categories 1-3 and the former Nationally Scarce (or Nationally Notable) categories A and B. Collectively, they are referred to as the GB Rarity status. Although in this section a distinction is made between the Nationally Scarce species defined under the older system and those defined under the newer system, since the two categories are for all usual purposes identical they are combined under the name “Nationally Scarce” in assessment and discussion. The different abbreviations are, however, maintained in tables and lists of species, so that their origins are clear.

Species not falling into any formal conservation category have been assessed as either local or common. Neither “local” nor “common” have precise definitions, and are used in the context of this report only to distinguish between species of wide distribution and either broad or very commonly met habitat requirements, and those which, because of more specialised habitat requirements, lesser mobility, or other

cause, are of less frequent occurrence. These categories have been applied according to personal experience and the opinions of standard texts, and must be considered in part subjective.

Formal conservation categories used are the most recent published statuses applied by the Nature Conservancy Council and the Joint Nature Conservation Committee, obtained from the following sources:

- Coleoptera Hubble, 2014; Hyman & Parsons, 1992
- Diptera Falk, 1991b
- Hemiptera Kirby, 1992
- Hymenoptera Falk, 1991a
- Lepidoptera Fox et al., 2012; Waring & Townsend, 2017

The list has also been checked for any species included in Section 41 of the NERC Act 2006 ("species of principal importance for the conservation of biodiversity in England") (**S41**). Such species are, however, a rather eclectic mix, and are largely irrelevant to assessment.

The abbreviations in bold are those used in tables and species lists in this report.

Nomenclature

Checklists and other sources used for names have been selected as far as possible on the basis of easy availability, broad coverage, specific reference to the British fauna, of being reasonably recent, and of their availability in printed form. There are few occasions when all these criteria are met. The following main sources have been used, but in some cases names have been updated from more recent sources:

- Araneae Merrett *et al*., 2014
- Coleoptera Duff, 2012
- Dermaptera Sutton, 2015
- Diptera Chandler, 2012
- Hemiptera Auchenorrhyncha Biedermann & Niedringhaus, 2009
- Hemiptera Heteroptera Aukema & Rieger, 1995-2006
- Hymenoptera Aculeata Archer, 2004
- Lepidoptera Agassiz *et al*., 2013
- Neuroptera Plant, 1997
- Orthoptera Sutton, 2015

Appendix B
Notes on species with formal conservation status

Scientific name	English name	Status	Notes
Kalcapion semivittatum	a seed weevil	Na	Local and with a very restricted distribution in southern counties, but gradually increasing in range; the foodplant is annual mercury, the larvae feeding in the stems, and the beetle can occur almost wherever there is a good and persistent population of the host.
Podagrica fuscipes	a leaf beetle	NS	Local but increasing in southern counties; recorded from a range of habitats, especially disturbed grassland, arable field margins, and weedy ground in urban and suburban areas; on mallows.
Hippodamia variegata	Adonis' ladybird	Nb	Frequent and increasing, no longer worthy of formal status; found amongst open-structured or sparse vegetation in dry habitats, including arable field margins.
Tychius pusillus	a weevil	Nb	Fairly common, but restricted to southern England, probably under-recorded; in short, open-structured to sparse vegetation in grasslands, roadsides, brownfield sites, sand dunes and other open areas on well-drained substrates; on lesser trefoil.
Olibrus millefolii	a shining flower beetle	Nb	Somewhat local but widely distributed and by no means scarce in south-eastern England. Larvae develop in the flowerheads of yarrow; small plants growing in open swards on well-drained substrates are preferred.
Acanthiophilus helianthi	a gall fly	N	Local in south-eastern counties, and often at low density. Larvae develop in the flowerheads of Asteraceae. Knapweeds are the most frequently recorded hosts, but it can occur on other members of the family.
Merzomyia westermanni	a gall fly	N	Frequent but rather local in southern and midland counties of England, and seemingly commoner than in the recent past; the formal status is open to doubt; associated chiefly with hoary ragwort growing on poorly-drained clay soils, but occasionally recorded from common ragwort; larvae develop in the flower-heads.
Asiraca clavicornis	a planthopper	Nb	Currently seems to be expanding and locally not uncommon, but seemingly prone to large population fluctuations with unknown causes; found in a wide range of open habitats and grasslands, including species-poor tall grassland at arable field margins.
Nysius graminicola	a groundbug	RDB3	Until recently rare and very local with a few sites scattered across southern England, but more frequently recorded in recent years and of rather uncertain status; easily under-recorded amongst large populations of its commoner relatives; open-structured vegetation in dry, sandy places; ecology poorly understood, but probably a seed-feeder associated with members of the daisy family in unshaded dry habitats.
Lygus pratensis	a capsid bug	RDB3	Now widespread throughout southern Britain following a dramatic range expansion, and no longer deserving a formal conservation status; in a wide range of grassy and ruderal habitats, often common on agricultural land.
Mimumesa unicolor	a solitary wasp	Na	A species of restricted distribution, found mainly around the Thames Estuary and the coasts of Hampshire and West Sussex; a recent addition to the British list, easily confused with others of the genus, possibly overlooked and perhaps spreading slowly inland; its habitat requirements are rather poorly known, but it seems to be associated mainly with damp areas such as seepage areas on soft-rock cliffs and the vicinity of reed-beds; it nests in burrows in exposed soil.
Myrmica schencki	a red ant	Nb	Scarce and mostly restricted to the south-east of England; in hot, dry, sheltered sites, including dunes, cliffs, unimproved pasture and downland, heaths, banks and railway cuttings; warmth-loving and usually found among sparse vegetation or in short turf.
Ponera coarctata	indolent ant	Nb	Local and restricted to southern England and the south-east coast of Wales, but probably under-recorded; warm, sheltered habitats, including open stony ground, grassland, landslips, crumbling cliffs and open woodland as well as waste ground, scrub and large gardens in urban areas; favours damp soils.
Lasioglossum malachurum	sharp-collared furrow bee	Nb	Has expanded dramatically since 1990; now common in much of southern England and no longer deserving of a formal conservation status; found in a range of open habitats, including coastal cliffs and landslips, abandoned quarries, commons, chalk grassland and private gardens; ground-nesting.

Scientific name	English name	Status	Notes
Lasioglossum pauperatum	squat furrow bee	RDB3	Rare and restricted to southern England, mostly the Thames Gateway and Hampshire; open flowery habitats including soft-rock cliffs and dry coastal grassland; ground-nesting.
Lasioglossum pauxillum	lobe-spurred furrow bee	Na	Has expanded dramatically in recent decades and is now locally common across southern England and into the midlands; no longer deserving of a formal conservation status; in a wide range of dry habitats but perhaps especially calcareous grasslands and brownfield sites.
Lasioglossum puncticolle	ridge-cheeked furrow bee	Nb	Scarce and restricted to south-east England; in a wide range of habitats including open, broad-leaved woodland, but most frequent in coastal habitats such as coastal land slips, soft-rock cliffs and estuarine fore-shores.
Calophasia lunula	toadflax brocade	RDB	Formerly a rarity confined to a few localities on the south coast, this species has expanded greatly in range and frequency, especially in urban and brownfield locations, and is now a widespread and frequent species in the south-east, though still somewhat local.
Coenonympha pamphilus	small heath	NT	Declining, but still a more or less common species over much of Britain; dry, well-drained grassland with a short to medium sward.

Appendix C
Complete list of species recorded 22nd August 2017

Group	Family	Species	Status	Grassland	Runway/ tracks	Peripheral habitats
Araneae	Araneidae	*Araneus diadematus*	common	x	x	x
Araneae	Araneidae	*Araneus quadratus*	common			x
Araneae	Araneidae	*Neoscona adianta*	local			x
Coleoptera	Anthicidae	*Omonadus formicarius*	common		x	
Coleoptera	Apionidae	*Aspidapion aeneum*	common		x	x
Coleoptera	Apionidae	*Aspidapion radiolus*	common		x	x
Coleoptera	Apionidae	*Ceratapion gibbirostre*	common		x	
Coleoptera	Apionidae	*Ischnopterapion loti*	common		x	
Coleoptera	Apionidae	*Ischnopterapion virens*	common		x	
Coleoptera	Apionidae	*Kalcapion semivittatum*	Na			x
Coleoptera	Apionidae	*Malvapion malvae*	common		x	x
Coleoptera	Apionidae	*Omphalapion hookerorum*	local	x		
Coleoptera	Apionidae	*Protapion fulvipes*	common		x	
Coleoptera	Byrrhidae	*Byrrhus pilula*	common		x	
Coleoptera	Carabidae	*Amara ovata*	common		x	
Coleoptera	Carabidae	*Paradromius linearis*	common		x	
Coleoptera	Carabidae	*Philorhizus melanocephalus*	common		x	
Coleoptera	Carabidae	*Pterostichus madidus*	common		x	
Coleoptera	Chrysomelidae	*Chaetocnema hortensis*	common	x		
Coleoptera	Chrysomelidae	*Chrysolina banksi*	local	x		
Coleoptera	Chrysomelidae	*Derocrepis rufipes*	local	x		
Coleoptera	Chrysomelidae	*Longitarsus flavicornis*	common		x	
Coleoptera	Chrysomelidae	*Longitarsus succineus*	common	x	x	
Coleoptera	Chrysomelidae	*Neocrepidodera ferruginea*	common	x		
Coleoptera	Chrysomelidae	*Neocrepidodera transversa*	common	x	x	
Coleoptera	Chrysomelidae	*Phyllotreta atra*	common			x
Coleoptera	Chrysomelidae	*Phyllotreta nigripes*	common	x	x	x
Coleoptera	Chrysomelidae	*Phyllotreta nodicornis*	local	x		
Coleoptera	Chrysomelidae	*Podagrica fuscipes*	NS		x	
Coleoptera	Chrysomelidae	*Sphaeroderma testacea*	common		x	
Coleoptera	Coccinellidae	*Coccinella septempunctata*	common	x	x	x
Coleoptera	Coccinellidae	*Hippodamia variegata*	Nb		x	
Coleoptera	Coccinellidae	*Nephus redtenbacheri*	common	x		
Coleoptera	Coccinellidae	*Propylea quattuordecimpunctata*	common	x	x	x
Coleoptera	Coccinellidae	*Psyllobora vigintiduopunctata*	common	x		
Coleoptera	Coccinellidae	*Rhyzobius litura*	common		x	
Coleoptera	Coccinellidae	*Subcoccinella vigintiquattuorpunctata*	common			x
Coleoptera	Coccinellidae	*Tytthaspis sedecimpunctata*	common	x		x
Coleoptera	Curculionidae	*Anthonomus rubi*	common		x	
Coleoptera	Curculionidae	*Ceutorhynchus contractus*	common	x		x
Coleoptera	Curculionidae	*Ceutorhynchus obstrictus*	common	x	x	
Coleoptera	Curculionidae	*Mecinus pascuorum*	common		x	
Coleoptera	Curculionidae	*Rhinusa antirrhini*	local	x		
Coleoptera	Curculionidae	*Sitona hispidulus*	common		x	
Coleoptera	Curculionidae	*Sitona humeralis*	common	x	x	

Group	Family	Species	Status	Grassland	Runway/ tracks	Peripheral habitats
Coleoptera	Curculionidae	*Sitona lineatus*	common	x	x	x
Coleoptera	Curculionidae	*Tychius picirostris*	common			x
Coleoptera	Curculionidae	*Tychius pusillus*	Nb			x
Coleoptera	Delphacidae	*Xantholinus linearis*	common		x	
Coleoptera	Kateretidae	*Brachypterolus pulicarius*	common	x		
Coleoptera	Phalacridae	*Olibrus aeneus*	common		x	
Coleoptera	Phalacridae	*Olibrus liquidus*	common	x	x	x
Coleoptera	Phalacridae	*Olibrus millefolii*	Nb	x	x	
Coleoptera	Phalacridae	*Phalacrus fimetarius*	local	x		
Coleoptera	Phalacridae	*Stilbus testaceus*	common		x	
Coleoptera	Silphidae	*Silpha laevigata*	local		x	
Crustacea	Armadillidiidae	*Armadillidium vulgare*	common		x	
Crustacea	Philosciidae	*Philoscia muscorum*	common		x	
Dermaptera	Forficulidae	*Forficula auricularia*	common		x	x
Diptera	Dolichopodidae	*Dolichopus griseipennis*	common	x		
Diptera	Limoniidae	*Symplecta stictica*	common	x		
Diptera	Sciomyzidae	*Pherbellia cinerella*	common	x		x
Diptera	Syrphidae	*Episyrphus balteatus*	common	x		
Diptera	Syrphidae	*Eristalis pertinax*	common	x		
Diptera	Syrphidae	*Melanostoma mellinum*	common	x		x
Diptera	Syrphidae	*Scaeva pyrastri*	common	x		
Diptera	Syrphidae	*Sphaerophoria ruepellii*	local		x	x
Diptera	Syrphidae	*Sphaerophoria scripta*	common	x	x	
Diptera	Syrphidae	*Syritta pipiens*	common	x	x	x
Diptera	Syrphidae	*Xanthogramma pedissequum*	local	x		
Diptera	Tachinidae	*Eriothrix rufomaculatus*	common	x		
Diptera	Tachinidae	*Tachina fera*	common	x		
Diptera	Tephritidae	*Acanthiophilus helianthi*	N	x		x
Diptera	Tephritidae	*Merzomyia westermanni*	N			x
Diptera	Tephritidae	*Sphenella marginata*	common	x	x	
Diptera	Tephritidae	*Tephritis formosa*	common	x	x	x
Diptera	Tephritidae	*Terellia ruficauda*	common		x	
Diptera	Tephritidae	*Terellia serratulae*	common		x	
Diptera	Tephritidae	*Trupanea stellata*	local		x	
Hemiptera	Anthocoridae	*Orius niger*	common	x	x	
Hemiptera	Aphrophoridae	*Neophilaenus lineatus*	common	x		x
Hemiptera	Aphrophoridae	*Philaenus spumarius*	common	x	x	x
Hemiptera	Cicadellidae	*Anoscopus serratulae*	common	x		
Hemiptera	Cicadellidae	*Aphrodes makarovi*	common	x		
Hemiptera	Cicadellidae	*Arthaldeus pascuellus*	common	x		
Hemiptera	Cicadellidae	*Macrosteles laevis*	common	x		
Hemiptera	Cicadellidae	*Mocydia crocea*	common	x		
Hemiptera	Cicadellidae	*Psammotettix nodosus*	common	x		
Hemiptera	Cicadellidae	*Zyginidia scutellaris*	common	x		
Hemiptera	Cydnidae	*Tritomegas sexmaculatus*	?			x

Group	Family	Species	Status	Grassland	Runway/ tracks	Peripheral habitats
Hemiptera	Delphacidae	*Asiraca clavicornis*	Nb		x	
Hemiptera	Delphacidae	*Javesella pellucida*	common	x	x	x
Hemiptera	Delphacidae	*Stenocranus minutus*	common	x		
Hemiptera	Delphacidae	*Xanthodelphax stramineus*	local	x		
Hemiptera	Lygaeidae	*Nysius graminicola*	RDB3		x	
Hemiptera	Lygaeidae	*Nysius huttoni*	common		x	
Hemiptera	Lygaeidae	*Nysius senecionis*	common		x	
Hemiptera	Lygaeidae	*Scolopostethus affinis*	common		x	
Hemiptera	Lygaeidae	*Stygnocoris fuligineus*	common	x	x	
Hemiptera	Lygaeidae	*Stygnocoris rusticus*	local	x		
Hemiptera	Miridae	*Adelphocoris lineolatus*	common		x	
Hemiptera	Miridae	*Campylomma verbasci*	local		x	
Hemiptera	Miridae	*Charagochilus gyllenhalii*	local	x	x	
Hemiptera	Miridae	*Chlamydatus pullus*	local		x	
Hemiptera	Miridae	*Dicyphus annulatus*	local		x	
Hemiptera	Miridae	*Dicyphus epilobii*	common			x
Hemiptera	Miridae	*Europiella artemisiae*	common	x	x	
Hemiptera	Miridae	*Lygus maritimus*	common		x	x
Hemiptera	Miridae	*Lygus pratensis*	RDB3	x	x	x
Hemiptera	Miridae	*Notostira elongata*	common	x		x
Hemiptera	Miridae	*Orthops campestris*	common	x		
Hemiptera	Miridae	*Phytocoris varipes*	common	x	x	x
Hemiptera	Miridae	*Plagiognathus arbustorum*	common		x	
Hemiptera	Miridae	*Trigonotylus coelestialium*	common	x		
Hemiptera	Nabidae	*Himacerus mirmicoides*	common		x	
Hemiptera	Nabidae	*Nabis flavomarginatus*	common	x		
Hemiptera	Nabidae	*Nabis rugosus*	common	x		
Hemiptera	Pentatomidae	*Dolycoris baccarum*	common			x
Hemiptera	Pentatomidae	*Eurydema oleracea*	common	x		
Hemiptera	Rhopalidae	*Corizus hyoscyami*	local		x	
Hemiptera	Tettigometridae	*Tettigometra ?laeta*	new to Britain		x	
Hemiptera	Tettigometridae	*Tettigometra ?virescens*	new to Britain		x	
Hemiptera	Tingidae	*Kalama tricornis*	local		x	
Hymenoptera	Andrenidae	*Andrena minutula*	common	x		
Hymenoptera	Apidae	*Apis mellifera*	common	x	x	x
Hymenoptera	Apidae	*Bombus lapidarius*	common	x	x	x
Hymenoptera	Apidae	*Bombus pascuorum*	common	x	x	x
Hymenoptera	Colletidae	*Colletes hederae*	local	x		
Hymenoptera	Crabronidae	*Mimumesa unicolor*	Na	x		
Hymenoptera	Crabronidae	*Pemphredon lethifer*	common			x
Hymenoptera	Formicidae	*Formica cunicularia*	local	x	x	x
Hymenoptera	Formicidae	*Formica fusca*	common	x	x	x
Hymenoptera	Formicidae	*Lasius niger*	common	x	x	x
Hymenoptera	Formicidae	*Myrmica sabuleti*	common	x	x	
Hymenoptera	Formicidae	*Myrmica scabrinodis*	common	x	x	

Group	Family	Species	Status	Grassland	Runway/ tracks	Peripheral habitats
Hymenoptera	Formicidae	*Myrmica schencki*	Nb	x	x	
Hymenoptera	Formicidae	*Ponera coarctata*	Nb		x	
Hymenoptera	Halictidae	*Halictus rubicundus*	common	x		
Hymenoptera	Halictidae	*Halictus tumulorum*	common	x	x	
Hymenoptera	Halictidae	*Lasioglossum albipes*	common	x		
Hymenoptera	Halictidae	*Lasioglossum calceatum*	common	x	x	
Hymenoptera	Halictidae	*Lasioglossum malachurum*	Nb	x		x
Hymenoptera	Halictidae	*Lasioglossum morio*	common	x	x	
Hymenoptera	Halictidae	*Lasioglossum pauperatum*	RDB3			x
Hymenoptera	Halictidae	*Lasioglossum pauxillum*	Na		x	
Hymenoptera	Halictidae	*Lasioglossum puncticolle*	Nb			x
Hymenoptera	Halictidae	*Lasioglossum villosulum*	common	x		
Lepidoptera	Lycaenidae	*Aricia agestis*	local	x		
Lepidoptera	Lycaenidae	*Polyommatus icarus*	local	x		
Lepidoptera	Noctuidae	*Autographa gamma*	common	x		
Lepidoptera	Noctuidae	*Calophasia lunula*	RDB	x		
Lepidoptera	Nymphalidae	*Aglais io*	common			x
Lepidoptera	Nymphalidae	*Coenonympha pamphilus*	NT	x		
Lepidoptera	Nymphalidae	*Maniola jurtina*	common	x		
Lepidoptera	Nymphalidae	*Pyronia tithonus*	common	x		
Lepidoptera	Nymphalidae	*Vanessa atalanta*	common			x
Lepidoptera	Nymphalidae	*Vanessa cardui*	common			x
Lepidoptera	Pieridae	*Pieris brassicae*	common	x		
Lepidoptera	Pieridae	*Pieris napi*	common	x		
Lepidoptera	Pieridae	*Pieris rapae*	common	x		
Lepidoptera	Sphingidae	*Deilephila porcellus*	local	x		
Lepidoptera	Sphingidae	*Macroglossum stellatarum*	migrant			x
Mollusca	Helicidae	*Cernuella virgata*	common			x
Mollusca	Hygromiidae	*Monacha cantiana*	common			x
Mollusca	Pupillidae	*Pupilla muscorum*	local		x	
Neuroptera	Chrysopidae	*Chysoperla carnea*	common	x	x	
Orthoptera	Acrididae	*Chorthippus brunneus*	common	x	x	x
Orthoptera	Tettigoniidae	*Conocephalus fuscus*	common	x		
		Number of recorded species	169	97	88	53
		Number of NS/RDB species	19	8	8	8

Appendix 7.8

RiverOak Strategic Partners

Manston Airport Outfall Corridor

Preliminary Ecological Appraisal Report 2017

October 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

RiverOak Strategic Partners

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No.	Details	Date
1	Draft	20/10/2017
2		

Contents

1. Introduction

1.1 Background

Manston supported an operational airport between 1916 and 2014. Until 1998 it was operated by the Royal Air Force as RAF Manston, and, for a period in the 1950s, was also a base for the United States Air Force (USAF). From 1998 it was operated as a private commercial airport with a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In the most recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014, much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal remain intact.

RiverOak Strategic Partners is planning to redevelop and reopen Manston Airport as a new air freight and cargo hub for the South East. Ecological surveys were carried out to establish a baseline and to assess the potential impact that any associated works and subsequent operation may have on ecological receptors, these results formed the biodiversity chapter of the Preliminary Environmental Information Report (PIER) as part of the requirements of the consultation process under Sections 42 and 47 of the Planning Act 2008 ("the 2008 Act"), as part of the application for Development Consent Order (DCO) under the 2008 Act to authorise the redevelopment[1]. The Order Limits of the application have recently been extended to include the outfall pipeline corridor that runs from the south-east corner of the former airport to a discharge point at Pegwell Bay. It is proposed that the outfall is used for surface water drainage from the proposed development site.

1.2 Purpose of report

The purpose of this report is to provide baseline ecological information to support a DCO application for the future re-opening and development of Manston Airport. Our approach is in accordance with industry standard practice[2],[3], which initially comprises a desk-based study and extended Phase 1 habitat survey of the Site and its immediate surroundings. The extended Phase 1 habitat survey approach aims to identify the presence, or potential presence of legally protected[4] / priority species[5]. The methods used in carrying out the ecological work at the Site are detailed in Section 3 with the results presented in Section 4. Section 5 makes recommendations for any further work deemed to be necessary.

1.3 Site context

The survey area was linear and comprised a buffer of 30 m either side of the line of the existing underground pipeline, resulting in a survey corridor of 60 m width and approximately 1.34 km in length, hereafter referred to as 'the Site'. The Site is located within the district of Thanet in Kent, close to the coastal town of Ramsgate. The approximate central point of the Site is at National Grid Reference (NGR) TR 330 657.

The outfall pipeline runs from the former Manston Airport site boundary, south east to the discharge point at Pegwell Bay (see Figure 1, Appendix A for location). The Site is situated predominantly within urban habitats, including residential buildings and associated amenity grassland and scrub along Foads Lane and Clive Road in the north and Meverall Avenue and Sandwich Road in the south. The southern extent of the Site consists of chalk cliffs which separate the Pegwell Bay amenity grassland and the hardstanding associated with a disused helipad which meets the sea. Access to the underground pipeline is from a series of manholes along its length.

[1] Amec Foster Wheeler (May 2017). Manston Airport DCO EIA. Preliminary Environmental Information Report: Chapter 7 Biodiversity. Doc No: 38199CR019i3 PEIR 22052017.
[2] IEA (1995). Guidelines for Baseline Ecological Assessment. E & F Spon, London.
[3] CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland. 2ND Edition. Available at www.cieem.net.
[4] See Appendix B for summary protected species legislation information.
[5] Scientific names for all species referred to in the main text of this report are provided in Appendix E.

2. Legislative and policy context

A number of sites, habitats and species are protected through either statute or national or local policy: details of these are provided in Boxes 1 and 2.

Box 1 Designated Wildlife Sites, and Priority Habitats and Species

Statutory nature conservation sites

Internationally important Sites: Special Areas of Conservation (SACs) and candidate SACs, Special Protection Areas (SPAs) and proposed SPAs, Sites of Community Importance, Ramsar Sites and European offshore marine Sites.

Nationally important Sites: Sites of Special Scientific Interest (SSSIs) that are not subject to international designations and National Nature Reserves (NNRs)

Local Nature Reserves (LNRs) are statutory Sites that are of importance for recreation and education as well as nature conservation. Their level of importance is defined by their other statutory or any non-statutory designation (e.g. if an LNR is also an SSSI but is not an internationally important Site, it will be of national importance). If an LNR has no other statutory or non-statutory designation it should be treated as being of district-level importance for biodiversity (although it may be of greater socio-economic value).

Non-statutory nature conservation sites

Local Wildlife Sites (LWS): In Kent LWS are designated on a county level, by a specialist panel that includes representatives from that includes amongst others Kent County Council, Natural England and the Kent Wildlife Trust. Kent LWS were previously known as Sites of Nature Conservation Importance (SNCIs).

Priority habitats and species

In this report, the geographic level at which a species/habitat has been identified as a priority for biodiversity conservation is referred to as its level of 'species/habitat importance'. For example, habitats and species of principal importance for the conservation of biological diversity in England (see the third bullet point below) are identified as of national species/habitat importance reflecting the fact that these species/habitats have been defined at a national level. The level of importance therefore pertains to the species/habitat as a whole rather than to individual areas of habitat or species populations, which cannot be objectively valued, other than for waterfowl, for which thresholds have been defined for national/international 'population importance'.

- International importance: populations of species or areas of habitat for which European Sites are designated;
- International importance: populations of birds meeting the threshold for European importance (1% of the relevant international population);
- National importance: habitats and species of principal importance for the conservation of biological diversity in England, and listed under Section 41 (s41) of the Natural Environment and Rural Communities (NERC) Act 2006. These habitats and species are listed on: http://jncc.defra.gov.uk/page-5705 They include those former UK Biodiversity Action Plan (UK BAP) priority habitats and species that occur in England;
- National importance: Species listed as being of conservation concern in the relevant UK Red Data Book (RDB) or Birds of Conservation Concern (BoCC) Red List[6];
- National importance: Nationally Scarce species, which are species recorded from 16-100 10x10km squares of the national grid;
- National importance: Populations of birds comprising at least 1% of the relevant British breeding/wintering population (where data are available);
- National importance: Ancient woodland (i.e. areas that have been under continuous woodland cover since at least 1600); and
- County importance: Species and habitats listed in the Kent local Biodiversity Action Plan (LBAP)[7].

Box 2 Legally Protected and Controlled Species

Legal protection

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included on Schedules 1, 5 and 8 of the *Wildlife and Countryside Act 1981* (as amended), excluding:
  - species that are only protected in relation to their sale (see Section 9[5] and 13[2]), reflecting the fact that the proposed development does not include any proposals relating to the sale of species; and
  - species that are listed on Schedule 1 but that are not likely to breed on or near the Site, given that this schedule is only applicable whilst birds are breeding;
- Species included on Schedules 2 and 5 of The *Conservation of Habitats and Species Regulations 2010* (as amended); and
- Badgers, which are protected under the *Protection of Badgers Act 1992*.

A summary of the legislation pertaining to faunal species that may occur on the Site is provided in Appendix B.

Legal control

Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) lists species of animal that it an offence to release or allow to escape into the wild and species of plant that it is an offence to plant or otherwise cause to grow in the wild.

[6] Red-listed criteria include: historical decline in the breeding population; and/or severe breeding population decline over 25 years/longer term: severe non-breeding population decline over 25 years/longer term; severe breeding range decline over 25 years/longer term; severe non-breeding range decline over 25 years. Source: Eaton, M.A., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud D., and Gregory, R. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds, 108:708-746.

[7] Kent BAP (2016) [Online] Available from: http://www.kentbap.org.uk/

3. Methods

3.1 Desk study

A data-gathering exercise was undertaken to obtain information relating to statutory and non-statutory nature conservation sites, priority habitats and species, and legally protected and controlled species (see Boxes 1 and 2).

Data were requested from Kent and Medway Biological Records Centre (KMBRC) and obtained through a review of the Multi-agency Geographic Information for the Countryside (Magic)[8] website, open access aerial mapping resources[9] and aerial photographs of the Site and surrounding area and from Ordnance Survey maps[10]. Data were gathered for:

- Statutory designated sites (national and international) on or within a 10 kilometre (km) radius of the Site;
- Non-statutory designated sites of nature conservation interest located on, or within 2 km of the Site;
- Ancient woodland and other national/local priority habitats on, or within 5 km of the Site (where not already covered by statutory and non-statutory sites);
- Records of legally protected and otherwise notable species made on, or within 5 km of the Site, including records of bats and bat roosts from the Kent Bat Group;
- Water bodies (potential great crested newt breeding habitat) within 500 metres (m)[11] of the Site, not separated from the Site by barriers (e.g. major roads, rivers, etc.) to great crested newt movement.

Analysis of species data focuses only on records from post 2000, as older records may not give an accurate picture of the current ecological interest on the Site. This contextual information is important as it may point to notable species that could occur on the Site itself.

This search was carried out for the Manston Airport redevelopment site which extends approximately 2.43 km north and 3.79 km west of the most northern point of the Site. The priority, legally protected and controlled species data was used to inform the outfall corridor desk study, however it should be noted that the search radius extends further west and north than the standard search area described above, and therefore records falling to the north and west may not be relevant to the Site itself.

Further data and contextual information was obtained from the following sources:

- Natural England (NE): studies commissioned by NE into the numbers and distribution of golden plover in the Sandwich Bay and Thanet area, the results of which are reported in Griffiths (2004)[12] and Henderson & Sutherland (2017)[13];
- Sandwich Bay Bird Observatory (SBBO): provided a map showing the main locations for wintering golden plover in the Sandwich Bay area, derived from ongoing studies into the species by the SBBO;

[8] http://magic.defra.gov.uk/MagicMap.aspx
[9] http://maps.google.co.uk
[10] https://www.ordnancesurvey.co.uk/osmaps
[11] English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough. This states that 500 m is generally accepted to be the dispersal distance of great crested newts over land between breeding ponds. English Nature is now Natural England.
[12] Griffiths, M. (2004). Numbers and distribution of the wintering golden plover population in and around the Thanet Coast and Sandwich Bay SPA in 2002/2003. English Nature Research Report Number 569. English Nature: Peterborough.
[13] Henderson, A. & Sutherland, M. (2017). Numbers and distribution of Golden Plovers in the Thanet Coast and Sandwich Bay SPA during the winter of 2016/2017. A report for Natural England in March 2017.

- Kent Ornithological Society (KOS): bird records were extracted from their online database, for all species within 5 km of the Site (http://birdgroups.co.uk/kos/default.asp, accessed in August 2016); and
- British Trust for Ornithology (BTO): Wetland Bird Survey (WeBS) core count data for 1995/96-2014/15 inclusive, and low tide data for 2002/03 and 2008/09 (the most recent winters for which data was available) was purchased from the BTO, for their Pegwell Bay count sector. In addition, further core count and low tide data for Pegwell Bay was from obtained from the BTO website (www.bto.org).

3.2 Field survey

Habitats

An Extended Phase 1 survey of the Site and its surrounds was undertaken by an Amec Foster Wheeler ecologist on 6 September 2017; during the survey, distinct habitats were identified and any features of interest subjected to a more detailed description in a target note (TN)[14]. As the standard Phase 1 habitat survey methodology is mainly concerned with vegetation communities, the survey was Extended[15] to allow for the provision of information on other ecological features, including identification of the presence or potential presence of legally protected and otherwise notable species.

It should be noted that while every effort has been made to provide a comprehensive description of the Site, this survey does not constitute a full botanical survey.

Protected or otherwise notable species

The methodologies used to establish the presence or potential presence of specific species and/ or species groups are summarised below. These relate to those species or biological taxa that the desk study and habitat types present indicated could occur on the Site.

Bats

A general assessment of the suitability of the habitats on the Site to support roosting, foraging and commuting bats was made. Buildings on the Site were inspected externally and any potential bat roost sites, such as gaps under roofing felt, were recorded, as were opportunities for bats to access potential roosts (e.g. cracks and holes, weatherboards). In addition, any evidence of bats (e.g. scratching, staining, lack of cobwebbing across potential bat access points, and droppings) around potential roost exits were noted.

Birds

The Site was assessed for its potential to provide nesting habitat for breeding birds or to support important assemblages of rare or notable bird species.

Great crested newt

Where access was possible, water bodies within 500 m of the Site and their associated terrestrial habitats, were assessed for their potential to support great crested newts. This excluded those water bodies that appeared to be separate from the Site by major barriers to great crested newt dispersal, as identified during the desk study (section 3.1). Suitable habitats include generally still, fish-free water bodies with adjacent woodland or grassland areas where there is optimal invertebrate prey potential.

[14] Joint Nature Conservation Committee (2010). Handbook for phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough.
[15] Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E&FN Spon, London.

Reptiles

The Site and its surrounds were assessed for their potential to provide sheltering, foraging and breeding habitats for the four common reptile species: slow worm, viviparous lizard, grass snake and adder. These native reptile species generally require open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or (in the case of grass snake) water body margins. Suitable well drained and frost free areas are needed so that they can survive the winter.

Other species

In addition, an assessment was made of the potential for the Site to support any other species considered to be of value for biodiversity conservation, including those that were identified as occurring within the local area by the desk study.

Controlled species

Where legally controlled species were identified on the Site, a target note was made to record the location of the record, and extent of growth (in the case of plant species).

4. Results

4.1 Desk Study

Statutory Nature Conservation Sites

There are 11 statutory designated nature conservation sites within 10 km of the Site. Summary descriptions of these, with the approximate distances from the Site (in ascending order) are provided in Table 4.1, and their locations in relation to the Site are shown on Figure 4.1 (Appendix A).

Table 4.1 Statutory designated nature conservation sites within 10 km of the Site

Site name and designation	Site interest features	Distance (metres) and direction from Site boundary
International		
Sandwich Bay to Hacklinge Marshes – SSSI	The SSSI (covering 1,790 ha) contains the most important sand dune system and sandy coastal grassland in South East England. There are also a wide range of other habitats such as mudflats, saltmarsh, chalk cliffs, freshwater grazing marsh, scrub and woodland are found here. This SSSI comprises grazing marsh habitats within Minster Marshes and often supports large wintering populations of waders, some of which regularly reach levels of National Importance. Associated with the SSSI are outstanding assemblages of both terrestrial and marine plants and invertebrates. Notified features include: non-breeding populations of golden plover, grey plover, ringed plover and sanderling, and the assemblage of breeding birds within areas of lowland open waters and their margins.	On Site
Sandwich Bay – SAC	The SAC (covering 1,137 ha) has primarily been designated due to the presence of four Annex I habitats: embryonic shifting dunes; shifting dunes along the shoreline with European marram grass - 'white dunes'; fixed coastal dunes with herbaceous vegetation; and dunes with *Salix repens* ssp. *Argentea*.	On Site
Thanet Coast and Sandwich Bay – Ramsar	The Ramsar site (covering 2,169 ha) is designated for supporting internationally important numbers of non-breeding turnstone (under Ramsar Criterion 6), and 15 Red Data Book invertebrate species associated with wetlands (under Criterion 2). In addition, the Ramsar site supports nationally important numbers of ringed plover and greenshank during spring/autumn passage, and golden plover, sanderling, red-throated diver and great crested grebe in winter.	0 m south
Thanet Coast and Sandwich Bay – SPA	The SPA (covering 1,838 ha) is designated for populations of European importance of turnstone (non-breeding); golden plover (non-breeding) and little tern (breeding)	0 m south
Thanet Coast – Marine SAC	The Marine SAC (covering 2,816 ha) contains the longest continuous stretch of coastal chalk in the UK, and is primarily designated for two Annex I Habitats: Reefs, and submerged or partially submerged sea caves.	5,580 m north
Outer Thames Estuary – Marine SPA	This marine Sea inlet (covering 379,824 ha) regularly supports internationally important numbers of the Annex I Species (red-throated diver) in winter.	7,960 m North
Margate and Long Sands – SAC and Site of Community Importance SCI (Inshore Marine)	Margate and Long Sands starts to the north of the Thanet coast of Kent and proceeds in a north-easterly direction to the outer reaches of the Thames Estuary. It contains a number of sand banks (an Annex I habitat) slightly covered by seawater at all times, the largest of which is Long Sands itself.	7,960 m North

National		
Sandwich Bay to Hacklinge Marshes – SSSI	The SSSI (covering 1,790 ha) contains the most important sand dune system and sandy coastal grassland in South East England. There are also a wide range of other habitats such as mudflats, saltmarsh, chalk cliffs, freshwater grazing marsh, scrub and woodland are found here. This SSSI comprises grazing marsh habitats within Minster Marshes and often supports large wintering populations of waders, some of which regularly reach levels of National Importance. Associated with the SSSI are outstanding assemblages of both terrestrial and marine plants and invertebrates. Notified features include: non-breeding populations of golden plover, grey plover, ringed plover and sanderling, and the assemblage of breeding birds within areas of lowland open waters and their margins.	0 m south
Sandwich and Pegwell Bay – NNR	The NNR (covering 629 ha) contains a complex mosaic of habitats including inter-tidal mudflats, saltmarsh, shingle beach, sand dunes, ancient dune pastures, chalk cliffs, wave cut platform and coastal scrubland. It supports the only ancient dune pasture in Kent. The reserve is of international importance for its wader and wildfowl populations. 615 Hectares (ha) of the NNR is managed as a Kent Wildlife Trust Reserve.	0 m south
Thanet Coast - SSSI	The SSSI (covering 817 ha) is notified for its coastal habitats and the plant and invertebrate communities they support; geological features and breeding and non-breeding bird populations. Non-breeding populations of golden plover, grey plover, ringed plover and sanderling; breeding little tern; and the variety of passage bird species all form notified features of the SSSI.	5,580 m north
Local		
Prince's Beachlands LNR	A narrow coastal site located between two sections of Sandwich and Pegwell Bay NNR and within the Sandwich Bay to Hacklinge Marshes SSSI. A complex mosaic of habitats of international importance for its bird populations.	2,490 m south

Non-statutory Nature Conservation Sites

There is one non-statutory site, Minster Marshes Local Wildlife Site (LWS ref. TH12), located within 2 km of the Site boundary. The LWS is located approximately 600 m to the south of the Site.

Priority Habitats

National Priority habitats occur within the Site itself; chalk cliffs and intertidal mudflats associated with the Sandwich Bay to Hacklinge Marshes SSSI and Sandwich Bay SAC are located to the southern extent of the Site at the outfall location (intertidal mudflats) and intersecting the Site north of the helipad (chalk cliffs).. The following National and/ or Local Priority habitats are known to occur within 2 km of the Site:

- Embryonic shifting dunes, white dunes (containing herbaceous vegetation) and Dunes with Salix spp. are found within Sandwich Bay SAC, qualifying as an Annex I habitats.
- Reefs and submerged or partially submerged sea caves are found along Thanet coast.
- Intertidal mudflats, saltmarsh, shingle beach, ancient grazing dunes, chalk cliffs, wave-cut platforms and coastal scrub are all found within the Sandwich Bay to Hacklinge Marshes SSSI.
- Hedgerows and fresh standing water may also occur, though none were noted on the returned data search.

Water bodies

Three water bodies were identified within 500 m of the Site (see Figure 4.2 in Appendix A), of which one is located within the former Manston Airport site to the north; another is a reservoir which lies in an arable field to the west; and the third is a large garden pond to the west of the Site.

Protected or otherwise notable species

The following legally protected and otherwise notable species have been recorded within 5 km of the Site since 2000. Where possible, a measurement of the distance from the Site is provided, however this is in relation to the Manston Airport redevelopment site. Species with the potential to utilise the Site (for example, for foraging, roosting or breeding) are discussed further, as follows:

Birds

KMBRC provided a summary table of the bird records they hold within 5 km of the Site. Table C1 in Appendix C shows a summary of the records of protected or otherwise notable bird species provided. Further details of the numbers and occurrence of bird species that form the qualifying or notified interest of statutory designated sites of nature conservation value (shown in Table 4.1) are discussed, as follows:

Golden Plover

The Thanet Coast & Sandwich Bay SPA was originally designated in part for the internationally important non-breeding population of golden plover that it supports. Nationally important numbers of non-breeding golden plover are also notified features of the Sandwich Bay to Hacklinge Marshes SSSI and Thanet Coast SSSI. However, as part of the third JNCC SPA review[16], golden plover was removed as a designated species from the SPA (likely due to declining numbers), although this change is, as yet unratified. The UK population was estimated to be 420,000 birds in winter[17].

There is the potential for golden plover to use the arable land adjacent to the Site for foraging and roosting. These birds would be considered part of the SPA population. Data provided by the SBBO and KOS show that golden plover winter on both intertidal and inland areas around Pegwell Bay, with their main feeding habitats being the arable fields and grazing marshes located inland of the dunes at Sandwich Bay (south of the Site). Very few records of golden plover were located within 2 km to the south, west and north of the Site. Results from the surveys in 2002/03[8] and 2016/17[9] indicate that numbers of golden plover have declined in the Sandwich Bay / Thanet area during the intervening years, from a high tide peak count of 4,962 birds (in January 2003) to only 1,536 (in late January 2017).

KMBRC provided a summary of the 1,073 records of golden plover (within approximately 5 km of the Site) they hold, the most recent of which being in 2012 and the closest to the Site, occuring on the intertidal mudflats of Pegwell Bay.

Turnstone

The Thanet Coast & Sandwich Bay SPA and Ramsar site are designated for their internationally important non-breeding numbers of turnstone. The SPA qualifying population of turnstone (of 940 individuals, 5-year peak mean counts from 1991/2-1995/6) represent 1.4% of the Western Palearctic population. Turnstone almost exclusively occur in coastal habitats, foraging and resting on rocky shorelines and beaches, but will also forage along the tidelines on sandy beaches and on mudflats. The Site and surrounding farmland provide no opportunities for foraging or resting turnstone, and therefore the species is unlikely to occur in this area.

[16] Stroud, D.A., Bainbridge, I.P., Maddock, A., Anthony, S., Baker, H., Buxton, N., Chambers, D., Enlander, I., Hearn, R.D., Jennings, K.R, Mavor, R., Whitehead, S. & Wilson, J.D. - on behalf of the UK SPA & Ramsar Scientific Working Group (eds.) (2016). *The status of UK SPAs in the 2000s: the Third Network Review*. [c.1,108] pp. JNCC, Peterborough. http://jncc.defra.gov.uk/page-7309.

[17] Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. and Stroud, D. (2013). Population estimates of birds in Great Britain and the United Kingdom. *British Birds, 106*: 64-100.

Little Tern

A breeding population of six pairs of Little tern is a qualification feature of the Thanet Coast & Sandwich Bay SPA, and a notified feature of the Thanet Coast SSSI. However, as part of the third JNCC SPA review (Stroud *et al*., 2016), little tern was removed as a designated species of the SPA, due to recent extirpation from the SPA, although this change is as yet, unratified. The little tern almost exclusively occurs in coastal habitats, nesting and foraging along shorelines and beaches. The Site and surrounding farmland provides no opportunities for foraging, resting or nesting little tern, and therefore the species is unlikely to occur in this area.

Other SPA/Ramsar qualifying and SSSI notified species

The Sandwich Bay and Hacklinge Marshes SSSI and Thanet Coast SSSI (both constituent SSSIs of the Thanet Coast & Sandwich Bay SPA) are notified (as well as for golden plover) for their nationally important non-breeding numbers of grey plover, ringed plover and sanderling. **Error! Reference source not found.**As with turnstone and little tern, grey plover, ringed plover and sanderling primarily inhabit coastal habitats and the Site and surrounding farmland provide no foraging or resting opportunities for these species, and therefore they are unlikely to occur in this area.

Lapwing

Lapwing is not a qualifying or notified feature of the Thanet Coast and Sandwich Bay SPA and its constituent SSSIs, although it is a species of principal importance, and is also a BoCC red-listed species. Lapwing and golden plover occupy very similar habitats in winter (including farmland). KMBRC provided a summary of the 1,271 records of lapwing they hold, within 5 km of the Site, the closest of which is located within the same 10 km grid reference as the Site. A five-year peak mean count of 11,890 lapwing was recorded in Pegwell Bay for the period 2008/09-2012/13 (as obtained from WeBS core count data). Results from the 2016/17 surveys also indicated a decline in lapwing numbers in the area, with a peak count of 6,171 birds recorded in November 2016, and a distribution that was broadly similar to that of golden plover[8]. Data obtained from the KOS website (www.kentos.org.uk/) shows that lapwing occur year-round within Pegwell Bay (1.8 km south-east of the Site), with a peak count of 22,000 birds recorded there on the 5 January 2013.

Great crested newts

KMBRC data provided one record of great crested newt, in 2011 at Monkton Chalk Pit Nature Reserve, 2.9 km to the west of the Site.

Reptiles

KMBRC provided records of three species of reptile within 5 km of the Site, a summary of which is shown in Table 4.3.

Table 4.3 Summary of reptile records within 5 km of the Site

Species	Number of records since 2000	Distance and direction of the closest record to the Site
Grass snake	11	2.9 km west
Slow-worm	59	2.3 km north
Viviparous Lizard	21	1.85 km south-east

Badger

The location of Badger records is **0** and this information should not be made available in the public domain; such records are therefore located within confidential 0.

Bats

There were 125 records of bats (since 2000) within 5 km of the Site, including at least six species: common pipistrelle; Nathusius' pipistrelle; soprano pipistrelle; brown long-eared bat; Natterer's bat and serotine. Table 4.2 shows the summarised data received from Kent Bat Group.

Table 4.2 Summary of bat records from within 5 km of the Site.

Species	No. of Records	Date of most recent record	Distance and direction from Site of the nearest record
Brown long-eared bat	20	2015	2.5 km south-west
Common pipistrelle	44	2015	1.0 km north-west
Nathusius' pipistrelle	2	2015	2.9 km north-east
Soprano pipistrelle	14	2015	2.4 km south-west
Pipistrellus Spp.	15	2015	1.5 km south-west
Natterer's bat	23	2015	3.4 km north-west
Serotine	1	2001	2.2 km south-east
Chiroptera Spp.	6	2015	2.0 km north-east

The closest record was of three grounded common pipistrelles, 1 km north-west of the Site, in 2012. The closest roost is located, 2.4 km to the south-west of the Site, with a peak count of 668 individual soprano pipistrelles recorded; this count was undertaken in July and included juveniles on the wing suggesting its function as a maternity roost.

Dormouse

The desktop study revealed no records of dormouse since 2000 within the 5 km radius of the Site.

Other species

Notable mammals

Records for a further three mammal species were provided by KMBRC for within 5 km of the Site. These included 106 records of brown hare since 2000, the closest of which being 1.85 km south-east of the Site. A total of 88 records of hedgehog were received, with the closest being 0.2 km east of the Site. Four records of harvest mouse were provided, the closest being 4.3 km south-west of the Site. All three are species of principal importance.

Invertebrates

KMBRC provided records of 137 species of invertebrates within 5 km of the Site, since 2000. Ten of which are priority species, including three butterflies (wall brown, small heath and small blue), a robber-fly, wasp and bee, and four moth species.

Vascular plants

Table 4.4 provides a summary of the KMBRC records of protected or otherwise notable vascular plant species found within 5 km of the Site.

Table 4.4 Vascular plants recorded within 5 km of the Site since 2000

Species	Legal status	No. of records since 2000	Distance and direction (km) of nearest record to the Site
Basil Thyme	S41	5	2.6 west
Bedstraw Broomrape	WCA8	1	4.5 south
Cornflour	S41	4	1.85 south-east
Deptford Pink	S41	3	4.5 south
Divided Sedge	S41	20	1.5 south-west
Man Orchid	S41	2	2.7 west
Martin's Ramping-fumitory	WCA8	3	0.1 west
Prickly Saltwort	S41	9	1.8 south-east
Sea Barley	S41	1	3.3 east
Tubular water-dropwort	S41	12	1.5 south-west

Key: S41, Species of Principal Importance (Section 41 of NERC); WCA8, The Wildlife and Countryside Act (1981) (as amended) Schedule 8.

Controlled species

KMBRC provided records of 14 legally controlled species recorded within 5 km of the Site since 2000. Of those listed only three; Japanese knotweed, wall cotoneaster and Himalayan cotoneaster are likely to occur on or adjacent to the Site, based on habitats present.

4.2 Field survey

Habitats

The dominant habitat on the Site, constituting approximately 450 m of the pipeline length, was urban, with hardstanding, buildings and amenity grassland recorded frequently. Areas of tall ruderal, dense continuous scrub and scattered scrub were recorded occasionally within the Site. Ephemeral/short perennial, hedgerow, arable, improved grassland and bare ground were also recorded rarely occurring on and adjacent to the Site. The outfall discharges into the maritime and inter-coastal habitats associated with Pegwell Bay. The mapped habitats are presented in Figure 4.3 (Appendix A). The following sections of this document describe the Site conditions at the time of the survey (6 September 2017) and appear in order of approximate abundance.

Hardstanding

Hardstanding constituted the majority of the Site. It was present throughout in the form of public roads, private driveways and a farmland track, railway and the former helipad in the south of the Site. Hardstanding was generally in good condition and regularly utilised except for the former helipad, which had significant tall ruderal growth and scattered scrub.

Amenity grassland

Gardens associated with private residential properties and grass verges along pavement were considered amenity grassland due to their function and regular cutting regime and were present in the north of the Site along Foads Lane and Clive Road and in the south along Meverall Avenue and Sandwich Road. These habitats were dominated by perennial rye-grass with frequent white clover, daisy and ribwort plantain.

Amenity grassland was also present in the south of the Site, surrounding the carpark for the Pegwell Bay National Nature Reserve, and was dominated by perennial rye-grass with frequent herb species such as yarrow, daisy, white clover and ribwort plantain and occasionally recorded shepherd's purse, dove's-foot crane's bill, groundsel, dandelion and bristly ox-tongue. Along the margin, between grassland and scrub habitat, where cutting appeared less frequent, species diversity was slightly higher and in addition to those species already recorded, were wall barley, cock's-foot, red clover, red fescue, false oat-grass, alexanders, creeping buttercup, sea plantain and red pimpernel.

Buildings/built structures

All buildings on the Site were 1960's style one or two storey residential properties. These were located within two areas of the Site; in the north along Foads Lane and Clive Road and in the south along Meverall Avenue and Sandwich Road. The rear of buildings lining the west of Cliff View Road were adjacent to the Site at its northern extent.

Photographs (from October 2017) of the engineered discharge structure at Pegwell Bay are provided in Appendix F.

Dense continuous, scattered scrub and non-native shrub

This habitat type lined either side of the railway track in the north of the Site and covered the chalk cliffs forming the Sandwich Bay to Hacklinge Marshes SSSI and was scattered throughout the helipad in the south of the Site. Species present were hawthorn, bramble, elder, ivy, traveller's joy and the non-native butterfly bush. In addition, in the south of the Site the species composition was more varied and included species more closely associated with coastal habitats, such as sea-buckthorn and non-native species including daisy bush and barberry.

Non-native and ornamental shrubs associated with private residences were present in the north of the Site along Foads Lane and Clive Road and in the south along Meverall Avenue. Species recorded included various cultivars of butterfly-bush, dogwood, laurel, hypericum, cotoneaster and box.

Tall ruderal

A margin of tall ruderal habitat was present along the eastern edge of the arable field in the north of the Site, adjacent to the rear gardens of the Clive Road properties, and along the margin of the continuous scrub associated with the railway line. Species present were typical of arable field margins, dominated by charlock, alexanders and common nettle, with cleavers, common mallow, smooth sow-thistle, bristly ox-tongue and Yorkshire fog also recorded. This habitat was also scattered throughout the degraded hardstanding that constituted the helipad in the south of the Site, and consisted of a more diverse range of species including abundant fennel and frequent oxeye daisy, perforate Saint John's-wort, common reed, mugwort, hemp agrimony, cock's-foot, common bent, yarrow spear thistle, English stonecrop, sea couch and lesser centaury.

Ephemeral/ short perennial

Ephemeral and short perennial vegetation was recorded to the south of the railway line, either side of the hardstanding farm track. Species recorded here included black medick, goat's beard, common bird's-foot-trefoil, shepherd's purse, field bindweed, field scabious, common knapweed bristly ox-tongue, teasel and creeping thistle.

Species-poor hedgerow

One species-poor hedgerow consisting of hawthorn, elder and blackthorn formed a border between arable land and an excavation site in the centre of the Site, north of Meverall Avenue.

Bare ground

A small area of bare ground was present in the centre of the Site, north of Meverall Avenue, where an active excavation was recorded. Two further areas; one consisting of shingle creating the base for the Viking Ship at Pegwell Bay; and the other of large rocks along the sea wall, neither supported any vegetation.

Cultivated land - Arable

One ploughed arable field was recorded in the northern extent of the Site. Two fields to the north of Meverall Avenue were also recorded as arable; with one field, to the west, supporting an asparagus crop, whilst the other, to the east, was stubble.

Species-poor improved grassland

One area supported this habitat; situated between the asparagus field and the railway line and forming a margin between track and arable field to the south. Perennial rye-grass was dominant with occasional records of those species already recorded within ephemeral/ short perennial habitat.

Protected or otherwise notable species

Badgers

In line with the legislation and best practice relating to badgers in the UK, results of badger survey work are contained within confidential Appendix D.

Bats

The buildings on the Site were found to be generally in good condition with no obvious broken soffits or tiles which would provide features for roosting bats or access to roof voids, however a full inspection of each building was not possible at the time of the survey. The buildings along the west side of Cliff View Road (TN2) had roofing of poorer condition providing features for roosting bats, however these buildings were not situated in the Site itself, sitting approximately 15m from the Site boundary.

Habitats on the Site provided limited commuting and foraging opportunities for bat species, the residential nature of the area would suggest that the area is well lit at night. However, the dense continuous and scattered scrub and tall ruderal vegetation in the south of the Site provided suitable habitat for commuting and foraging bat species which utilise edge habitats and clearings.

Birds

The tall ruderal (TN1), dense continuous and scattered scrub habitats (TN4), hedgerow (TN5) and non-native shrubs (TN6) provided foraging and nesting opportunities for birds. Due to the timing of the survey, the main breeding season for birds was finished and therefore breeding activity was not recorded.

Great crested newts

Habitats on the Site provided limited terrestrial habitat for great crested newt.

The three water bodies, as shown in Figure 4.2 (Appendix A), identified within 500 m of the Site were:

- Water body 1 was a small reservoir located within an arable field adjacent to the Site;
- Water body 2 was a large, garden pond with at least 20 ducks and no vegetation present; and
- Water body 3 (located within the main former airport site) was not assessed during the current survey.

Reptiles

The arable margins and area of semi-improved grassland along a south facing slope (TN3) and dense continuous scrub in the north of the Site provide limited opportunities to support the widespread reptile species, including viviparous lizard and slow worm.

Other species

Species of Principal Importance, such as hedgehog may occur on the Site, specifically foraging within grassland and gardens. Brown hare may utilise arable and grassland habitats within the Site.

No notable or protected plants were recorded during the survey. Habitats on the Site, including the tall ruderal and ephemeral growth scattered within the hardstanding of the helipad, did provide suitable vegetation to support those butterfly species identified during the desk study including the small blue.

Controlled species

Plants of the cotoneaster genus were recorded on the Site. There are five species listed under Schedule 9, however those recorded on Site were not identified to species level (there are 70 species within this genus). These survey records were restricted to private residential gardens and, as this legislation relates to those invasive species which have spread into the wild, are therefore not pertinent to this assessment.

5. Discussion and recommendations

Badgers

Recommendations are provided in Appendix D.

Bats

The desk study provided records of several bat species within 5 km of the Site, the habitats present on the Site have the potential to support all of these species but most likely common and soprano pipistrelle. Nathusius' pipistrelle is considered 'Rare' in the UK[18], and this species, although known to occur in the local area, is unlikely to regularly utilise habitats on the Site due to the lack of large water bodies with which this species is typically associated. Natterer's and brown long-eared bat are unlikely to utilise habitats recorded within the Site due to their preference for darker, continuous woodland habitats. The buildings on the Site may provide roosting opportunities for all species recorded within the desk study. However, due to the limited scope of works proposed with access to the outfall pipe restricted to the immediate vicinity of the manhole covers, no further surveys are required. However, where works surrounding manholes are required a best practice policy should be followed, including the restriction of works to daylight hours (to avoid the need for artificial lighting which may impact roosting, foraging and commuting bats). Should any works involve high levels of noise, this would require an assessment to determine the likelihood of disturbance to roosting bats.

Birds

Habitats suitable to support breeding and foraging bird species occur on and adjacent to the Site. Species likely to be present, as highlighted by the desk study, include widespread notable species; albeit the habitats are unlikely to support any population or assemblage of birds of importance to biodiversity conservation, due to their limited extent.

Although a breeding bird survey is not deemed to be necessary, there is a requirement to avoid contravention of the legislation relating to nesting birds in the UK (see Appendix B). As such it is recommended that any vegetation clearance is undertaken between late-August and late February to avoid the main nesting season. Caution should still be taken during this period, though, as birds occasionally breed outside the main nesting season. Alternatively, clearance must be preceded by an inspection of the vegetation by an experienced ecologist to check for nests, with any nests found left undisturbed and protected until young birds have fledged.

Any maintenance work to the outfall at the discharge point should be undertaken diurnally between May and late July when bird numbers of the adjacent designated site are at their lowest. In addition any works at that point should be undertaken diurnally at low tide when there is a large expanse of intertidal habitat available and birds are able to feed at distance from the discharge point, also preventing disturbance of any high tide roosts.

Great crested newts

No water bodies within a 500 m radius of the Site appear to offer breeding habitat for great crested newt, providing no vegetation for egg laying and supporting high levels of water fowl which predate newts and their eggs[19]. There is limited habitat to support terrestrial great crested newts and therefore no further survey work is deemed necessary.

Reptiles

Although there is a small area of habitat on Site which could support reptiles, the extent of the proposed works are limited to areas around the manhole covers which are mostly located on or adjacent to

[18] Bat Conservation Trust (2012). The state of the UK's bats; National Bat Monitoring Programme Population Trends 2012. Bat Conservation Trust, London.
[19] Beebee, T. J. C. & Griffiths, R. A. (2000). *Amphibians and Reptiles*. Harper-Collins, New Naturalist.

hardstanding, it if therefore unlikely that works would significantly impact this habitat. Should the scope of works change this assessment will require revision.

6. Conclusions

Eleven statutory designated sites are located within 10 km of the Site, the outfall corridor running from the former Manston Airport to a discharge point in the north of Pegwell Bay. Of the designated sites, the Thanet Coast and Sandwich Bay SPA/Ramsar site, Sandwich Bay SAC and Thanet Coast Marine SAC, are of international importance and are within or adjacent to the site at its southern extent. The constituent SSSIs of the SPA include the Thanet Coast SSSI and Sandwich Bay to Hacklinge Marshes SSSI, the latter also being located within the Site itself. These sites are designated for a variety of biodiversity including their habitats, flora and invertebrate interests, but also for non-breeding populations of birds, in particular, golden plover which could potentially occur within, or adjacent to the Site.

One Priority Habitat has been identified within the Site; chalk cliff, which constitutes part of the Sandwich Bay to Hacklinge Marshes SSSI. Three other Priority Habitats occurred within 2 km of the Site. These habitats consist of coastal embryonic shifting dune systems, intertidal mudflats, saltmarsh, grazing dunes, shingle beaches, wave-cut platforms and cliffs, located within the Sandwich Bay area; with submerged/partially submerged reefs and sea-caves along the Thanet coastline.

The desk study and field survey identified the potential for a number of legally protected and notable species to utilise the habitats within the Site:

- Badgers – refer to Appendix D for further details;
- Birds – potentially foraging and nesting within the Site;
- Bats – potentially foraging and commuting on the Site, and roosting in buildings on the Site; and
- Reptiles – potentially using suitable habitats in the north of the Site.

No further survey work is considered necessary in respect of these species/groups due to the limited extent of any works within the Site.

Appendix A Figures

Appendix B Legislation

All wild mammals (including rabbits and foxes)

Under the *Wild Mammals (Protection) Act 1996* it is an offence intentionally to cause unnecessary suffering to any wild mammal.

Badger

The Protection of Badgers Act 1992 makes it an offence to:

- wilfully kill, injure or take a badger;
- attempt to kill, injure or take a badger; or
- cruelly ill-treat a badger.

It is also an offence to interfere with a badger set by:

- damaging a badger sett or any part of it
- destroying a badger sett;
- obstructing access to, or any entrance of, a badger sett;
- disturbing a badger when it is occupying a badger sett, or

intending to do any of those things or being reckless as to whether his actions would have any of those consequences.

Bats (Rhinolophidae and Vespertilionidae)

All British bat species are listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and Schedule 2 of the *Conservation of Habitats and Species Regulations 2010* (as amended). They are afforded full protection under Section 9(4) of the Act and Regulation 41 of the Regulations. These make it an offence, *inter alia*, to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat (this applies anywhere, not just at its roost), in particular in such a way as to be likely to:
  - impair their ability to survive, breed or reproduce, or rear or nurture their young;
  - impair their ability to hibernate or migrate.
- affect significantly the local distribution or abundance of that bat species;
- damage or destroy a breeding site or resting place of any bat;
- intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection; or
- intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection (this is taken to mean all bat roosts whether bats are present or not).

In addition, five British bat species are listed on Annex II of the Habitats Directive. These are:

- Greater horseshoe bat (*Rhinolophus ferrumequinum*)
- Lesser horseshoe bat (*Rhinolophus hipposideros*)
- Bechstein's bat (*Myotis bechsteinii*)

- Barbastelle (*Barbastella barbastellus*)
- Greater mouse-eared bat (*Myotis myotis*)

In certain circumstances where these species are found the Directive requires the designation of Special Areas of Conservation (SACs) by EC member states to ensure that their populations are maintained at a favourable conservation status. Outside SACs, the level of legal protection that these species receive is the same as for other bat species.

Birds

With certain exceptions[20], all wild birds, their nests and eggs are protected by section 1 of the *Wildlife and Countryside Act 1981* (as amended). Therefore, it is an offence, *inter alia*, to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- intentionally take or destroy the egg of any wild bird.

These offences do not apply to hunting of birds listed in Schedule 2 of the Act subject to various controls.

Bird species listed on Schedule 1 of the Act receive further protection, thus for these species it is also an offence to:

- intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or
- intentionally or recklessly disturb the dependent young of any such bird.

For golden eagle, white-tailed eagle and osprey, it is also an offence to:

- take, damage or destroy the nest of these species (this applies at any time, not only when the nest is in use or being built).

Dormouse

Dormouse is listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and Schedule 2 of the *Conservation of Habitats and Species Regulations 2010* (as amended). This species is afforded full protection under Section 9(4) of the Act and Regulation 41 of the Regulations. These make it an offence, *inter alia*, to:

- deliberately capture, injure or kill any such animal;
- deliberately disturb any such animal, in particular in such a way as to be likely to:
  - impair their ability to survive, breed or reproduce, or rear or nurture their young;
  - impair their ability to hibernate or migrate.
  - affect significantly the local distribution or abundance of that species;
- damage or destroy a breeding site or resting place of any such animal;
- intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- intentionally or recklessly obstruct access to any place that any of these animals uses for shelter or protection.

[20] Some species, such as game birds, are exempt in certain circumstances.

Great crested newt

The great crested newt is listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and Schedule 2 of the *Conservation of Habitats and Species Regulations 2010* (as amended). It is afforded protection under Section 9(4) of the Act and Regulation 41 of the Regulations. These make it an offence, *inter alia*, to:

- deliberately capture, injure or kill any such newt;
- deliberately disturb any such newt, in particular in such a way as to be likely to:
  - impair their ability to survive, breed or reproduce, or rear or nurture their young;
  - impair their ability to hibernate or migrate.
  - affect significantly the local distribution or abundance of that species;
- deliberately take or destroy the eggs of such a newt;
- damage or destroy a breeding site or resting place of any such newt;
- intentionally or recklessly disturb any such newt while it is occupying a structure or place that it uses for shelter or protection; or
- intentionally or recklessly obstruct access to any place that any such newt uses for shelter or protection.

This relates to both the aquatic and terrestrial habitat they occupy. The legislation applies to all life stages of this species.

Reptiles

The four widespread[21] species of reptile that are native to Britain, namely common or viviparous lizard, slow worm, adder and grass snake, are listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and are afforded limited protection under Section 9 of this Act. This makes it an offence, *inter alia*, to:

- intentionally kill or injure any of these species.
- intentionally or recklessly obstruct access to any place that any of these animals uses for shelter or protection.

Insects

The insects listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and afforded full protection under Section 9 of this Act are:

- the rainbow leaf beetle (*Chrysolina cerealis*), lesser silver water beetle (*Hydrochara craboides*) and violet click beetle (*Limoniscus violaceus*);
- the mire pill beetle (*Curimopsis nigrita*)*;
- the beetles *Graphoderus zonatus, Hypebaeus flavipes* and *Parcymus aeneus*;
- the large copper (*Lycaena dispar*), heath fritillary (*Mellicta athalia*), marsh fritillary (*Eurodryas aurinia*) and swallowtail (*Papilio machaon*) butterflies;
- the field (*Gryllus campestris*) and mole (*Gryyllotalpa gryllotalpa*) crickets;
- the New Forest cicada (*Cicadetta montana*);

[21] The other native species of British reptile (sand lizard and smooth snake) receive a higher level of protection in England and Wales under the *Conservation of Habitats and Species Regulations 2010* and the *Wildlife and Countryside Act 1981* (as amended). However, the distribution of these species is restricted to only a very few sites. All marine turtles (*Cheloniidae and Dermochelyidae*) are also protected.

- the southern damselfly (*Coenagrion mercuriale*) and Norfolk aeshna dragonfly (*Aeshna isosceles*);
- the wart-biter grasshopper (*Decticus verrucivorus*);
- the Barberry carpet (*Pareulype berberata*), black veined (*Siona lineata*), Essex emerald (*Thetida smaragdaria*), fiery clearwing (*Bembecia chrysidiformis*), Fisher's estuarine (*Gortyna borelii*), New Forest Burnet (*Zygaena viciae*), reddish buff (*Acosmetia caliginosa*) and Sussex emerald (*Thalera fimbrialis*) moths.

This makes it an offence, *inter alia*, to:

- intentionally kill, injure, or take (handle) any of these species (* except the mire pill beetle);
- intentionally or recklessly damage, destroy or obstruct access to any place that any of these species uses for shelter or protection; or
- intentionally or recklessly disturb any of these species while it is occupying a structure or place that it uses for shelter or protection.

Other terrestrial and freshwater invertebrates

In addition to crayfish, insects and spiders, the following terrestrial and freshwater invertebrates are listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and afforded full protection under Section 9 of this Act:

- the medicinal leech (*Hirudo medicinalis*);
- a fairy shrimp (Chirocephalus diaphanus);
- the tadpole shrimp or apus (*Triops cancriformis*);
- the freshwater pearl mussel (*Margaritifera margaritifera*);
- the glutinous (*Myxas glutinosa*), sandbowl (*Catinella arenaria*) and Roman (*Helix pomatia*) snails.

This makes it an offence, *inter alia*, to:

- intentionally kill, injure, or take (handle) any of these species;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place that any of these species uses for shelter or protection; or
- intentionally or recklessly disturb any of these species while it is occupying a structure or place that it uses for shelter or protection.

Directive 2009/147/EC (The Wild Birds Directive), 2009

Certain species receive protection at a European level due to appearing on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version).

Certain endangered, rare, or vulnerable bird species, which warrant special protection, are included on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version); also referred to as the *Wild Birds Directive*.

The *Wild Birds Directive* recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It therefore places great emphasis on the protection of habitats for endangered as well as migratory species (listed in Annex I), especially through the establishment of a coherent network of Special Protection Areas (SPAs) comprising all the most suitable territories for these species. Together with Special Areas of Conservation (SACs) designated under *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive')*, SPAs form a network of pan-European protected areas known as Natura 2000.

Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Sites proposed for selection are advised by the UK statutory nature conservation agencies, or the relevant administration in the case of Overseas Territories and Crown Dependencies, co-ordinated through JNCC. In selecting sites, the relevant authorities are guided by the Criteria set out in the Convention. The Criteria pertaining specifically to birds are as follows:

- Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds; and
- Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

In the UK, the first Ramsar sites were designated in 1976 since which, many more have been designated. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also Special Protection Areas (SPAs) classified under the Birds Directive. However, greater attention is now being directed towards non-bird features which are increasingly being taken into account, both in the selection of new sites and when reviewing existing sites.

Natural Environment and Rural Communities Act 2006

Section 40 of the *Natural Environment and Rural Communities (NERC) Act 2006* places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of species which are of Principal Importance for conservation in the UK. This list is largely derived from the 'Priority Species' listed under the former UK Biodiversity Action Plan (BAP), which continue to be regarded as Priority Species under the subsequent country-level biodiversity strategies. The Section 41 list replaces the list published by Defra in 2002 under Section 74 of the *Countryside and Rights of Way (CRoW) Act 2000*.

Birds of Conservation Concern: Red List birds

Red and Amber list bird are those listed as being of high or medium conservation concern (respectively) in Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man (Eaton *et al*., 2015). Red list species are those that are Globally Threatened according to IUCN criteria; and/or those whose population or range has declined rapidly in recent years; and/or those that have declined historically and not shown a substantial recent recovery.

Appendix C Desk Study Data Summary

Table C1 Protected and other notable bird species within 5 km of the Site (KMBRC summary table)

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Red-throated diver	Annex 1; WCA1	319	2012	1.85
Black-throated diver	Annex 1; WCA1	171	2012	1.85
Great northern diver	Annex 1; WCA1	93	2012	4.13
Slavonian grebe	Annex 1; WCA1; BoCC (Red)	36	2011	1.85
Black-necked grebe	WCA1	10	2012	1.85
Balearic shearwater	S41; BoCC (Red)	13	2009	1.85
Storm petrel	Annex 1	11	2012	3.20
Leach's petrel	Annex 1; WCA1	32	2012	1.85
Bittern	Annex 1; WCA1; S41	14	2011	1.85
Little egret	Annex 1	1244	2012	1.85
Purple heron	Annex 1; WCA1	36	2013	0.50
Black stork	Annex 1	5	2006	1.85
White stork	Annex 1	30	2010	1.85
Glossy ibis	Annex 1	6	2010	1.85
Spoonbill	Annex 1; WCA1	87	2012	1.85
Bewick's swan	Annex 1; S41; WCA1	33	2012	1.85
Whooper swan	Annex 1; WCA1	40	2012	0.50
White-fronted goose	S41; BoCC (Red)	131	2012	1.86
Barnacle goose	Annex 1	25	2012	1.85
Brent goose	S41	817	2012	1.85
Shelduck	Annex 1	1021	2012	1.75
Pintail	WCA1	278	2012	1.85
Garganey	WCA1	125	2012	1.80
Pochard	BoCC (Red)	78	2012	2.80
Scaup	WCA1; S41; BoCC (Red)	28	2009	1.85
Long-tailed duck	WCA1; BoCC (Red)	32	2008	1.75
Common scoter	WCA1; S41; BoCC (Red)	371	2012	1.85
Velvet scoter	WCA1; BoCC (Red)	29	2012	1.85

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Goldeneye	WCA1	49	2012	1.75
Smew	Annex 1	8	2012	3.80
Honey buzzard	Annex 1; WCA1	93	2012	1.75
Black kite	Annex 1	24	2012	1.85
Red kite	Annex 1; WCA1	99	2012	1.65
Marsh harrier	Annex 1; WCA1	596	2012	1.85
Hen harrier	Annex 1; WCA1; S41; BoCC (Red)	404	2012	1.75
Montagu's harrier	Annex 1; WCA1	120	2013	0.50
Goshawk	WCA1	6	2005	1.85
Osprey	Annex 1; WCA1	94	2012	1.75
Merlin	Annex 1; WCA1; BoCC (Red)	580	2012	1.85
Hobby	WCA1	457	2013	0.50
Peregrine	Annex 1; WCA1	807	2012	1.85
Grey partridge	S41; BoCC (Red)	369	2012	0.50
Quail	WCA1	88	2012	1.85
Corncrake	Annex 1; WCA1; S41; BoCC (Red)	20	2011	1.75
Crane	Annex 1	35	2012	1.75
Avocet	Annex 1; WCA1	290	2012	1.85
Little ringed plover	WCA1	173	2012	1.75
Ringed plover	Cited; BoCC (Red)	984	2012	1.85
Kentish plover	WCA1	100	2012	1.85
Dotterel	WCA1; BoCC (Red)	42	2009	1.85
Golden plover	Annex 1; Cited	1073	2012	1.85
Grey plover	Cited	985	2012	1.85
Lapwing	S41; BoCC (Red)	1271	2012	0.50
Sanderling	Cited	911	2012	1.85
Temminck's stint	WCA1	53	2012	1.85
Purple sandpiper	WCA1	198	2012	1.85
Ruff	Annex 1; WCA1; BoCC (Red)	163	2012	1.85
Woodcock	BoCC (Red)	340	2012	0.50
Black-tailed godwit	WCA1; S41; BoCC (Red)	505	2012	1.85
Bar-tailed godwit	Annex 1	1071	2012	1.85

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Whimbrel	WCA1; BoCC (Red)	729	2013	1.85
Curlew	S41; BoCC (Red)	1066	2012	1.86
Greenshank	WCA1	747	2012	1.75
Green sandpiper	WCA1	435	2012	1.80
Wood sandpiper	Annex 1; WCA1	106	2012	1.75
Turnstone	Cited	850	2012	1.85
Arctic skua	BoCC (Red)	126	2012	1.85
Mediterranean gull	Annex 1; WCA1	369	2012	1.85
Little gull	WCA1	148	2012	1.85
Herring gull	S41; BoCC (Red)	842	2012	0.50
Kittiwake	BoCC (Red)	218	2012	1.85
Sandwich tern	Annex 1	1095	2012	1.85
Roseate tern	Annex 1; WCA1; S41; BoCC (Red)	86	2012	1.85
Common tern	Annex 1	531	2012	1.85
Arctic tern	Annex 1	111	2012	1.85
Little tern	Annex 1; Cited; WCA1	297	2012	1.85
Black tern	Annex 1; WCA1	114	2012	1.85
Puffin	BoCC (Red)	29	2006	1.85
Turtle dove	S41; BoCC (Red)	386	2012	0.50
Cuckoo	S41; BoCC (Red)	497	2012	0.50
Barn owl	WCA1	176	2012	0.50
Short-eared owl	Annex 1	543	2012	2.80
Nightjar	Annex 1; S41; BoCC (Red)	1	2004	1.85
Kingfisher	Annex 1; WCA1	343	2012	1.75
Bee-eater	WCA1	20	2012	1.85
Hoopoe	WCA1	47	2012	1.85
Wryneck	WCA1; BoCC (Red)	66	2012	1.85
Lesser spotted woodpecker	S41; BoCC (Red)	86	2005	1.75
Short-toed lark	Annex 1	7	2011	1.85
Woodlark	Annex 1; WCA1; S41	74	2012	4.83
Skylark	S41; BoCC (Red)	621	2012	0.50

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Shorelark	WCA1	64	2012	1.85
Tawny pipit	Annex 1	34	2012	1.85
Tree pipit	S41; BoCC (Red)	140	2012	1.85
Yellow wagtail	S41; BoCC (Red)	534	2012	0.50
Grey wagtail	BoCC (Red)	367	2012	1.85
Dunnock	S41	584	2012	0.50
Nightingale	BoCC (Red)	96	2012	1.75
Bluethroat	Annex 1; WCA1	35	2007	1.85
Whinchat	BoCC (Red)	435	2012	1.85
Ring ouzel	S41; BoCC (Red)	295	2012	4.83
Fieldfare	WCA1; BoCC (Red)	456	2012	1.86
Song thrush	S41; BoCC (Red)	645	2012	0.50
Redwing	WCA1; BoCC (Red)	679	2013	1.85
Mistle thrush	BoCC (Red)	452	2012	0.50
Cetti's warbler	WCA1	223	2012	2.80
Grasshopper warbler	S41; BoCC (Red)	58	2012	1.80
Aquatic warbler	Annex 1; S41; BoCC (Red)	9	2005	1.75
Dartford warbler	Annex 1; WCA1	41	2012	1.85
Barred warbler	Annex 1	28	2010	1.85
Wood warbler	S41; BoCC (Red)	33	2012	1.75
Firecrest	WCA1	564	2012	1.85
Spotted flycatcher	S41; BoCC (Red)	164	2012	0.50
Red-breasted flycatcher	Annex 1	52	2013	1.85
Pied flycatcher	BoCC (Red)	182	2012	0.50
Bearded tit	WCA1	34	2012	1.85
Willow tit	S41; BoCC (Red)	10	2009	1.85
Golden oriole	WCA1; BoCC (Red)	100	2012	1.75
Red-backed shrike	Annex 1; WCA1; BoCC (Red)	67	2011	1.85
Starling	S41; BoCC (Red)	637	2013	0.50
House sparrow	S41; BoCC (Red)	386	2012	0.50
Tree sparrow	S41; BoCC (Red)	239	2012	0.50
Brambling	WCA1	386	2012	1.86

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Serin	WCA1	49	2012	1.85
Linnet	S41; BoCC (Red)	718	2012	0.50
Twite	S41; BoCC (Red)	171	2012	1.85
Lesser redpoll	S41; BoCC (Red)	298	2012	1.86
Common crossbill	WCA1	189	2012	1.85
Parrot crossbill	WCA1	2	2004	2.16
Bullfinch	S41	157	2012	0.50
Hawfinch	S41; BoCC (Red)	26	2010	1.85
Lapland bunting	WCA1	130	2012	1.85
Snow bunting	WCA1	427	2012	1.85
Yellowhammer	S41; BoCC (Red)	200	2012	0.50
Ortolan bunting	Annex 1	9	2003	2.16
Reed bunting	S41	484	2012	1.86
Corn bunting	S41; BoCC (Red)	558	2012	0.50

Appendix D Confidential Species Report

Badgers are protected under the Protection of Badgers Act 1992 and as such they receive heightened legal protection. Badger records herein are CONFIDENTIAL and should not be made available to the public.

KMBRC returned four records of badger since 2000. Two records in 2003 from St. Nicholas at Wade (5 km west-north-west of Site) – one record from January and one from September. A single September record from Richborough 2005 was 5 km south of the Site. A single May record in 2006 from Netherhale Farm, near Birchington was 3.5 km north-west of the Site.

There is no further information available on these records.

No signs of badger were recorded during the Extended Phase 1 habitat survey although suburban and rural habitats on Site were considered suitable to support foraging and/ or commuting badgers.

Impacts caused by the reinstatement of the outfall are likely to cause only a negligible impact of temporary nature to foraging badgers and no further survey work is required. Best practice should be followed should any works be required around the manhole locations within the Site, including the covering of any excavation at night.

Appendix E Scientific Names

Common/ English name	Scientific name
Mammals	
Badger	*Meles meles*
Bat/*Chiroptera Sp.*	*Chiroptera Sp.*
Brown hare	*Lepus europaeus*
Brown long-eared bat	*Plecotus auritus*
Common pipistrelle	*Pipistrellus pipistrellus*
Dormouse	*Muscardinus avellanarius*
Harvest mouse	*Micromys minutus*
Hedgehog	*Erinaceus europaeus*
Nathusius' pipistrelle	*Pipistrellus nathusii*
Natterer's bat	*Myotis nattereri*
Pipistrelle/Pipistrellus species	*Pipistrellus species*
Serotine	*Eptesicus serotinus*
Soprano pipistrelle	*Pipistrellus pygmaeus*
Birds	
Red-throated diver	*Gavia stellata*
Great crested grebe	*Podiceps cristatus*
Ringed plover	*Charadrius hiaticula*
Golden plover	*Pluvialis apricaria*
Grey plover	*Pluvialis squatarola*
Lapwing	*Vanellus vanellus*
Sanderling	*Calidris alba*
Greenshank	*Tringa nebularia*
Green sandpiper	*Tringa ochropus*
Turnstone	*Arenaria interpres*
Little tern	*Sterna albifrons*
Robin	*Erithacus rubicula*
Blackbird	*Turdus merula*
House sparrow	*Passer domesticus*

Herpetofauna	
Grass snake	*Natrix natrix*
Slow-worm	*Anguis fragilis*
Viviparous lizard	*Zootoca vivipara*
Flora	
Alexanders	*Smyrnium olusatrum*
Asparagus	*Asparagus officinalis*
Barberry	*Berberis vulgaris*
Basil Thyme	*Clinopodium acinos*
Bedstraw Broomrape	*Orobanche caryophyllacea*
Black knapweed	*Centauria nigra*
Black medick	*Medicago lupulina*
Blackthorn	*Prunus spinosa*
Box	*Buxus sp.*
Bramble	*Rubus fruticosus agg.*
Bristly oxtongue	*Helminthotheca echioides*
Butterfly bush	*Buddleia davidii*
Charlock	*Sinapis arvensis*
Cleavers	*Galium aparine*
Cock's foot	*Dactylis glomerata*
Common bent	*Agrostis capillaris*
Common bird's-foot-trefoil	*Lotus corniculatus*
Common mallow	*Malvus sylvestris*
Common nettle	*Urtica dioica*
Common reed	*Phragmites australis*
Cornflower	*Centaurea cyanus*
Cotoneaster	*Cotoneaster sp.*
Creeping buttercup	*Ranunculus repens*
Creeping thistle	*Cirsium arvense*
Daisy	*Bellis perennis*
Daisy bush	*Brachyglottis greyii*

Dandelion	*Taraxicum officinale*
Deptford Pink	*Dianthus armeria*
Divided Sedge	*Carex divisa*
Dogwood	*Cornus sanguinea*
Elder	*Sambucus nigra*
English stonecrop	*Sedum sp.*
False oat-grass	*Arrhenatherum elatius*
Fennel	*Foeniculum vulgare*
Field bindweed	*Convolvulus arvensis*
Field scabious	*Knautia arvensis*
Goat's beard	*Tragapogon porrifolius*
Groundsel	*Senecio vulgaris*
Hawthorn	*Crataegus monogyna*
Hemp agrimony	*Eupatorium cannabinum*
Hypericum	*Hypericum sp.*
Ivy	*Hedera helix*
Laurel	*Laurus sp.*
Lesser centaury	*Centaurium pulchellum*
Man Orchid	*Orchis anthropophora*
Martin's Ramping-fumitory	*Fumaria reuteri*
Mugwort	*Artemesia vulgaris*
Oxeye daisy	*Leucanthemum vulgare*
Perennial rye-grass	*Lolium perenne*
Prickly Saltwort	*Kali turgidum*
Red clover	*Trifolium pratense*
Red fescue	*Festuca rubra*
Red pimpernel	*Anagallis arvensis*
Ribwort plantain	*Plantago lanceolata*
Saint John's wort	*Hypericum perforatum*
Sea Barley	*Hordeum marinum*
Sea couch	*Agropyron pungens*
Sea plantain	*Plantago maritima*
Sharp-leaved pondweed	*Potamogeton acutifolius*

Shepherds purse	*Capsella bursa-pastoris*
Smooth sow-thistle	*Sonchus oleraceus*
Teasel	*Dipsacus fullonum*
Traveller's joy	*Clematis vitalba*
Wall barley	*Hordeum murinum*
Yarrow	*Achillea milifolium*
Yorkshire fog	*Holcus lanatus*
Invasive species	
Japanese knotweed	*Fallopia japonica*
Wall cotoneaster	*Cotoneaster horizontalis*
Himalayan cotoneaster	*Cotoneaster simonsii*

Appendix F Photographs of the outfall discharge structure

634000 634500 635000 635500

165000 164500 164000

N

Depot

CANTERBURY ROAD W

KING ART

ARUND

WINDSO

CANTERBURY ROAD WEST

Hollins Bottom

A2

Reservoir

FOADS HILL

St

CLIVE ROAD

FOA

A299

A299

A299

Tunnel

Cliffsend Crossing

Cliffs End

Cliffsend Farm Cottages

CLIFFS END ROAD

SANDC

MEVERALL AVENUE

Cliffs End Farm

EARL

HALL

F

GREEN AVENUE

MOUNT

CL

COURTLANDS

Cycle Track

The Viking Boat

Causew

Great Cliffsend Farm House

COTTINGTON ROAD

St Augustine's Cross

BEECH GROVE

CLIFFS END GR

GROVE

Outfall

Outfall

Cliffsend Point

St Augustine's Well

Pegwell Bay

Key

Site boundary

0 50 100 150 200 250 m

Scale at A3: 1:5,000

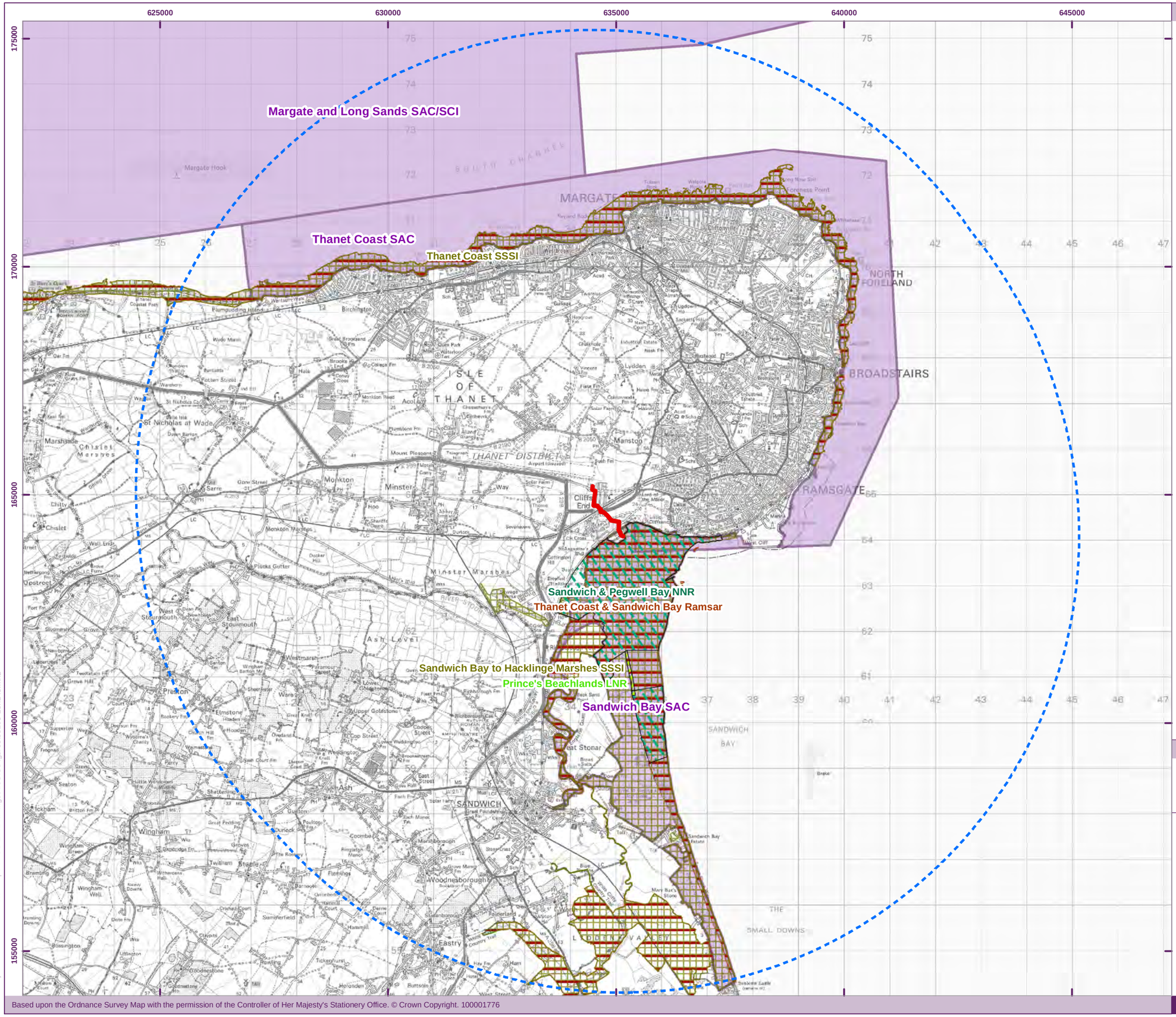
Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 1.1
Site location



Key

- Site boundary
- 10km study area
- Ramsar
- SSSI
- SAC
- Local Nature Reserve
- National Nature Reserve

0 1 2 3 4 5 km

Scale at A3: 1:80,000

Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.1
Statutory designated nature conservation sites

634000

635000

165000

164000

N

1

2

3

Reservoir

Oil Storage Depot

Cliffs End

Isle of Thanet

Hollins Bottom

Pegwell Bay

Cliffsend Crossing

Cliffsend Farm Cottages

Cliffs End Farm

Cliffsend Point

Tunnel

Causeway

Little Cliffsend Farm

Great Cliffsend Farm House

St Augustine's Cross

St Augustine's Well

St Augustine's Golf Course

Cottington Hill

The Viking Boat

Outfall

Cycle Path

Cycle Track

Reservoir

A299

A256

CANTERBURY ROAD WEST

COTTINGTON ROAD

CLIFFS END ROAD

SANDICH ROAD

CHALK HILL

WINDSOR ROAD

KINGARTHUR ROAD

ARUNDEL ROAD

CLIFF VIEW ROAD

SEAVIEW ROAD

COLLINGWOOD ROAD

HALL DRIVE

FARMSTEAD CRESCENT

ROADS LANE

MOUNT PLEASANT AVENUE

GREEN COURT AVENUE

CLIFFS END GROVE

BIRCH GROVE

KENTMERE AVENUE

WINDERMERE AVENUE

Key

Site boundary

500m buffer

Waterbody

0 200 400 m

Scale at A3: 1:8,000

Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.2
Waterbodies within 500 m of the Site

634300 634400 634500 634600 634700

165200 165100 165000 164900

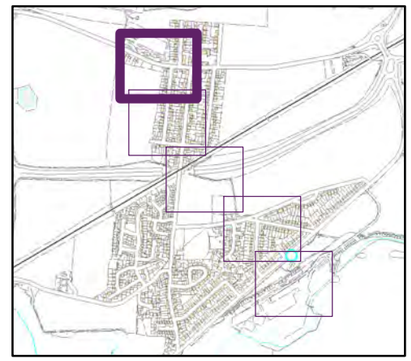
N

1

Key

- Manston Airport boundary
- Surface water
- RPS-L-Subsoil Ownership
- Tall ruderal
- A A A Arable - ploughed
- Target note

Index Map



0 20 40 60 80 m

Scale at A3: 1:1,500

Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.3
Extended Phase 1 habitat map

Page 1 of 5

634400 634500 634600 634700 634800

165000 164900 164800 164700

N

CLIFF VIEW

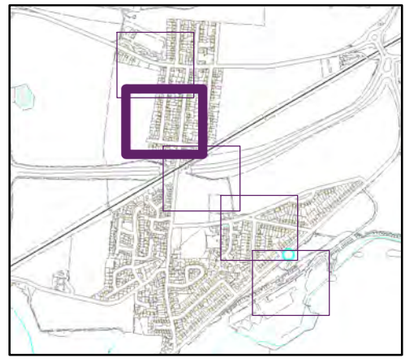
FOADS HILL

A299

Key

- Surface water
- RPS-L-Subsoil Ownership
- Scrub- dense/continous
- Tall ruderal
- Arable - ploughed
- Amenity grassland/garden
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Hardstanding
- Scattered tree
- Target note

Index Map



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Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.3
Extended Phase 1 habitat map

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634500 634600 634700 634800 634900

164800 164700 164600 164500

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CLIFF VIE

FOA

A299

FOADS LANE

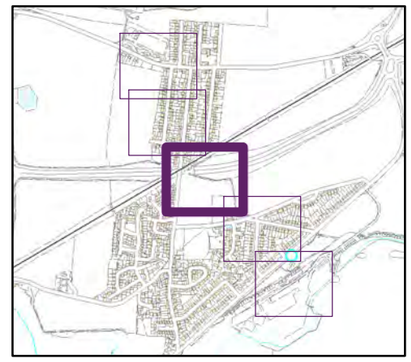
CLIFFS END ROAD

2 2 2 2 2 4 3 5

Key

- Surface water
- RPS-L-Subsoil Ownership
- Scrub- dense/continous
- Improved, species poor grassland
- Tall ruderal
- Arable - ploughed
- Amenity grassland/garden
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Hardstanding
- Intact hedge species poor
- Scattered tree
- Target note

Index Map



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Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.3
Extended Phase 1 habitat map

Page 3 of 5

634800 634900 635000 635100

164600 164500 164400 164300

N

5 6 4

CLIFFS END ROAD

MEVERALL AVENUE

THE VIKING BOAT

SANDWICH ROAD

Key

- Surface water
- RPS-L-Subsoil Ownership
- Scrub- dense/continous
- Scrub- scattered
- Improved, species poor grassland
- Tall ruderal
- Shingles/rocks
- Arable - ploughed
- Amenity grassland/garden
- Ephemeral/short perennial
- Introduced shrub
- Buildings
- Hardstanding
- Intact hedge species poor
- Scattered tree
- Target note

Index Map

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Scale at A3: 1:1,500

Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.3
Extended Phase 1 habitat map

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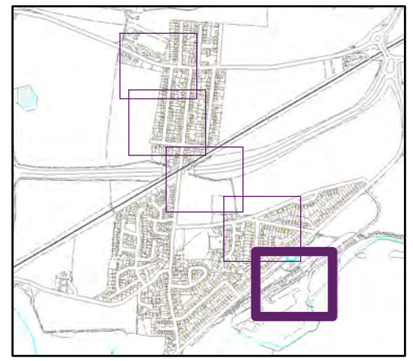
635200
635300
164300
164200
164100
164000
N
THE VIKING BOAT
SANDWICH ROAD
4
Sea

Key

- Surface water
- RPS-L-Subsoil Ownership
- Scrub- dense/continous
- Scrub- scattered
- Tall ruderal
- Sea
- Shingles/rocks
- Amenity grassland/garden
- Buildings
- Hardstanding
- Target note

Index Map



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Scale at A3: 1:1,500

Client

RSP

Manston Airport DCO
EIA
Outfall Corridor

amec foster wheeler

Figure 4.3
Extended Phase 1 habitat map

Page 5 of 5

Appendix 7.9

Technical note: Manston Airport DCO EIA

Extended phase 1 habitat survey of additional land within the Order Limits: Off Spitfire Way

1. Site context

This Site[1] is approximately 0.25 ha in extent and lies to the north of Spitfire Way (B2190) and the west of Manston Road (B2050) at the intersection of these two roads. The approximate central point is at National Grid Reference (NGR) TR 33107 66449.

The Site lies on the north-western boundary of the original Manston Airport site with residential areas to the north and arable farmland dominating the wider landscape. A woodland copse lies immediately north-west of the site, detaching it from the residential estates, and an area of semi-improved grassland lies along the south-western boundary. The site comprises brownfield land also with some evidence of ongoing storage of domestic waste.

2. Method

An extended phase 1 habitat survey of the Site and its surrounds was undertaken by a Wood (formerly Amec Foster Wheeler) ecologist on 12 October 2017; during the survey, distinct habitats were identified and any features of interest subjected to a more detailed description in a target note (TN)[2]. As the standard Phase 1 habitat survey methodology is mainly concerned with vegetation communities, the survey was extended[3] to allow for the provision of information on other ecological features, including identification of the presence or potential presence of legally protected and otherwise notable species.

It should be noted that while every effort has been made to provide a comprehensive description of the Site, this survey does not constitute a full botanical survey, although it was sufficient to identify the phase I habitats present.

3. Results

3.1 Habitats

The Site was dominated by bare ground and hardstanding with ephemeral/ short perennial and tall ruderal growth throughout. Hardstanding was located in the western third of the Site. This was in relatively good condition with piles of household waste, a skip and a shed type structure made of corrugated metal sheets along the boundary. Bare ground with tall ruderal growth dominated the eastern two thirds of the Site; species recorded included abundant yarrow, oxeye daisy, mugwort, bristly ox-tongue and white melilot, with

[1] The 'Site' here refers to the 0.25 ha of land off Spitfire Way that was surveyed and not the larger Order Limits site of the RSP DCO application.
[2] Joint Nature Conservation Committee (2010). Handbook for phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough.
[3] Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E&FN Spon, London.

occasional ribwort plantain, common mallow, creeping thistle, purple flax, and colt's-foot. Fennel, false oat grass and hedge bindweed were frequent along the Site boundary. Ash and sycamore saplings, and elder with dense ivy cover lined the north-eastern boundary.

3.2 Protected and notable species

The Site and surrounding habitats provided suitable basking/foraging/refuge habitat for the commonly occurring reptile species, slow worm and common lizard. They also provided suitable foraging habitat for widespread birds and hedgehog, a priority species[4].

Figure 1 shows the mapped habitats and target notes (TN).

4. Summary and Recommendations

4.1 Habitats

No notable habitats are present onsite. 'Open Mosaic Habitats on Previously Developed Land' is a NERC Act 2006 section 41 habitat, however the extent of this habitat onsite is <0.25ha and as such it does not meet the criteria as a notable habitat.

The area of woodland located immediately offsite to the north-west, comprises lowland mixed deciduous woodland, a habitat of Principal Importance for Biodiversity Conservation and a Kent Biodiversity Action Plan habitat. Direct impacts are not anticipated to this habitat; however, due to proximity it is recommended that working practices measures should be implemented to prevent any potential indirect impacts (i.e. pollution / dust).

4.2 Species

Reptiles

The mosaic habitat of bare ground, ephemeral /short perennial and tall ruderal vegetation onsite provides potential reptile basking/foraging habitat. The surrounding woodland also provides opportunities for refuge. Therefore it is recommended a full suite of reptile presence / absence surveys should be undertaken between April and October inclusive, following the survey methods outlined in Froglife (1999)[5], which requires seven visits. If present, a method statement and associated mitigation (such as reptile exclusion fencing) may be required to ensure that reptiles are not impacted by the proposed works.

Birds

Vegetation clearance should take place outside of the breeding bird season (which is February to September depending on seasonal variation). If this is not possible, the work area should be searched immediately prior to commencement of works (within 24 hours) by an ecologist to ensure that no nesting bird nests are present. If active nests are found to be present they must be left in situ and protected with a buffer/exclusion zone until any young birds have fledged the nest.

Other notable species

The Site has the potential for hedgehog. It is therefore recommended that during any vegetation clearance works an Ecologist (or suitably competent person) is present to carry out a detailed check for hedgehog.

[4] Listed under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 as a species "of principal importance for the purpose of conserving biodiversity" in England.
[5] Froglife (1999) Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation Froglife Advice Sheet 10.

Author	Reviewer
…….	…….
Kelly Jones	Mark Linsley

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Key

Application boundary

Parkland and scattered trees-broad-leaved

Broadleaved woodland - semi-natural

Neutral grassland - semi-improved

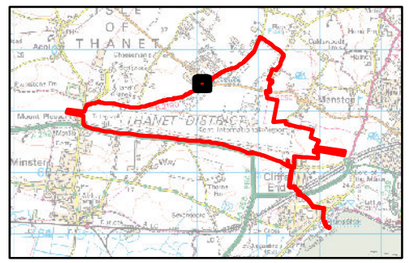
Tall ruderal

Ephemeral/short perennial

Buildings

Bare ground

Hardstanding



0 10 20 30 m

Scale at A3: 1:600

Client

RSP

Manston Airport DCO
EIA

amec foster wheeler

Figure 1
Extended phase 1 habitat map - Land off Spitfire Way

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Appendix 7.10

Technical note: Manston Airport DCO EIA: Extended phase 1 habitat survey of Land Parcel 1362

1. Site context

This site is approximately 35.7 hectares[1] (ha) in extent and lies to the south of the A299 Hengist Way and west of the A299 and the A256 Richborough Way. The Cottington Link Road runs adjacent to the southern boundary. The Site is located in Manston, Kent with the approximate central point at National Grid Reference (NGR) TR 33720 64773.

The site lies beyond the southern boundary of the proposed development site. Arable land and associated farm buildings surround the site and, other than the former airport site to the north, farmland dominates the wider landscape. A land parcel to the west of the site and south of the A299 supports a solar farm and a woodland copse lies immediately south of this. A main line railway is also present to the southeast corner of the site.

2. Method

An extended phase 1 habitat survey of the site and its surrounds was undertaken by a Wood (formerly Amec Foster Wheeler) ecologist on 12 October 2017. During the survey distinct habitats were identified and any features of interest subjected to a more detailed description in a target note (TN)[2]. As the standard Phase 1 habitat survey methodology is mainly concerned with vegetation communities, the survey was extended[3] to allow for the provision of information on other ecological features, including identification of the presence or potential presence of legally protected and otherwise notable species.

It should be noted that while every effort has been made to provide a comprehensive description of the Site, this survey does not constitute a full botanical survey, although it was sufficient to identify the phase 1 habitats present.

3. Results

Habitats

The site was dominated by bare ground in the form of a recently sown arable field with a narrow margin around the perimeter, approximately 0.5 to 1 metre (m) wide with tall ruderal growth. Dominant plant species within the field margin were hoary mustard, bristly ox-tongue, with occasional bastard cabbage, cleavers, prickly sow-thistle and dove's-foot crane's-bill.

Beyond the field margin and adjacent to the highway there was a strip of semi-improved grassland along the northern half of the western and eastern Site boundaries, with a number of grass species recorded; including red fescue, perennial rye-grass, cock's-foot, false oat-grass, Yorkshire fog, smooth meadow grass and

[1] As measured using the tool in MAGIC: http://magic.defra.gov.uk/MagicMap.aspx
[2] Joint Nature Conservation Committee (2010). Handbook for phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough.
[3] Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E&FN Spon, London.

crested dog's-tail, with the following herb species being common: bristly ox-tongue, red clover, mugwort, creeping thistle and hoary mustard. Other species recorded at lower frequencies were bastard cabbage, cleavers, prickly sow-thistle, spear thistle, common ragwort, common mallow, dove's-foot crane's-bill and Canadian fleabane.

In the semi-improved grassland strip adjacent the dual carriageways a recently planted species-rich hedgerow was present along the northern and eastern boundary of the site. This comprised young trees (approximately 1.5m in height) protected with tree guards. Species included typical native hedgerow species such as hawthorn, hazel, blackthorn, wayfaring-tree, oak, buckthorn and dogwood.

A waterbody (a pond) was located in the south-east corner of the site. The pond was possibly created to provide a catchment for water runoff from the adjacent dual carriageways. The pond appeared dry at the time of survey, although access to/visibility of the waterbody was restricted by the presence of dense common reed with occasional common reed mace. The outer edge of the waterbody was dominated by field horsetail and occasional teasel and willow saplings. A recently planted hedgerow surrounded the water body and had planted goat willow, dog rose and butterfly bush, in addition to the recently planted species mentioned above. Ground flora was more diverse here with, in addition to those species mentioned above, fennel, lucerne and curled dock.

Cottington Road ran along the southern boundary of the site, with an arable field located to the south of Cottington Road; part of this appeared to have been recently cultivated with the remainder containing an asparagus crop. A line of Leyland cypress ran along the boundary of these fields with the Cottington Road.

In the south of the site a species-poor, gappy hedgerow (3-4 m high) created a boundary between the site and the arable field to the west. Dominant species of this hedgerow included cherry spp, elm, elder with dense ivy growth and blackthorn. Holly, oak and poplar were recorded occasionally as standard trees within the hedgerow, and ground flora was species-poor, with cleavers, bastard cabbage, hogweed, common nettle and mugwort recorded. Large gaps (5-10m) were frequent and fallen trees resulted in large areas of dead wood on the ground.

Immediately offsite, further to the north of the western boundary the field ran alongside a small broadleaved woodland plantation with young sycamore, elm, ash and cherry with a sparse understory.

Figure 1 shows the mapped habitats.

Protected and notable species

The arable habitat has the potential to support ground nesting birds, including lapwing and skylark (both red-list BoCC[4] / SPI[5]), and also overwintering golden plover (a qualifying species for the adjacent Thanet Coast and Sandwich Bay Special Protection Area). This habitat may also provide refuge for brown hare (SPI).

Adjacent habitats, including the hedgerow and woodland copse to the west of the site provide good potential for protected and notable species.

A number of burrows identified during the survey were of a size which may indicate use by badgers, however these were located down a slope within the hedgerow extending along the western boundary of the site (approximate grid reference: TR 33562 64977), and could not be accessed for a detailed inspection. A number of mammal runs and one badger latrine were also recorded in the vicinity.

Standard trees within the hedgerow along the western boundary, namely the poplars, provided features suitable to support roosting bats and the hedgerow provided a lateral feature for which bats are likely to utilise for foraging and commuting.

The large areas of fallen dead wood, provide suitable habitat for saproxylic invertebrates and hibernacula opportunities for reptiles and great crested newt and other amphibian species. The semi-improved

[4] Bird of Conservation Concern. Source: Eaton, M.A., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud D., and Gregory, R. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds, 108:708-746.
[5] Species of Principal Importance in England, listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

grassland, and recently planted hedgerows also provided suitable habitat to support common reptile species such as slow worm and common lizard.

All habitats provided suitable habitats for nesting and foraging birds.

4. Summary and Recommendations

4.1 Habitats

The arable field, comprising the majority of the site, is considered to be of negligible conservation value. The semi-improved grassland habitats are also largely considered to be of low value for nature conservation as they are comprised of locally common species, which are abundant in the local area.

The hedgerows present onsite do not qualify as 'important' as defined by the The Hedgerows Regulations 1997, being either species poor or young in age (i.e. less than 30 years old). However, hedgerows are also a NERC Act 2006 section 41 habitat of principal importance and are defined as being '*any boundary line of trees or shrubs over 20m long and less than 5m wide, and where any gaps between the trees or shrub species are less that 20m wide*' (UK BAP, 2008[6]). The hedgerows present onsite are likely to meet the criteria as a NERC Act 2006 section 41 habitat of principal importance being >20m long and <5m wide and comprising native woody species.

A single pond is present on site. Ponds, for the purpose of the NERC Act 2006 section 41 habitat of principal importance, are defined as permanent and seasonal standing water bodies up to 2 ha in extent, which meet one or more of a set of criteria as defined by the Biodiversity Reporting and Information Group (BRIG) 2008 (updated in 2011)[7]. Further survey work would be required to determine the status of the pond.

The area of woodland located immediately offsite to the west, comprises lowland mixed deciduous woodland, a habitat of Principal Importance and a Kent Biodiversity Action Plan habitat. Direct impacts are not anticipated to this habitat; however, due to proximity to the site it is recommended that working practices include measures to prevent any potential indirect impacts (i.e. pollution / dust).

4.2 Species

Badger

Evidence of badger was recorded during the phase 1 survey. It is therefore recommended that a pre-construction badger survey is undertaken in advance of works, in order to identify any setts and assess levels of badger activity. If a badger sett is found, depending upon the final design of the works, a method statement or licence from Natural England may be required prior to commencement of works.

Bats

Trees with potential to support bat roosting features have been identified within the site. It is therefore recommended a detailed ground level roost assessment of trees is undertaken, including an inspection of the exterior of trees to look for features that could be used for roosting bats. If evidence of bats is recorded or a feature is found to provide good bat roosting potential further bat presence / absence surveys should be undertaken, in accordance with current Bat Conservation Trust guidelines[8] (May – August/September inclusive). A method statement or mitigation licence from Natural England may be required for bats prior to commencement of works.

[6] BRIG (ed. Ant Maddock) 2008. UK Biodiversity Action Plan: Priority Habitats Descriptions. (Updated 2011).
[7] Ponds that met the criteria to qualify as UK BAP priority habitats are deemed to qualify as habitat of Principal Importance. These are defined as permanent and seasonal water bodies up to 2 ha in extent, which meet one of the following criteria: (1) Habitats of international importance; (2) Species of high conservation importance; (3) Exceptional assemblages of key biotic groups; (4) Ponds of high ecological quality; (5) Other important ponds: i.e. important because of age, rarity of type or landscape context.
[8] Collins, J. (ed) (2016). Bat Survey for Professional ecologists: Good Practice Guidelines, 3rd Edition, Bat Conservation Trust, London.

Birds

Vegetation clearance should take place outside of the breeding bird season (which is February to September depending on seasonal variation). If this is not possible, the work area should be searched immediately prior to commencement of works (within 24 hours) by an ecologist to ensure that no nesting bird nests are present. If active nests are found to be present they must be left in situ and protected with a buffer/exclusion zone until any young birds have fledged the nest.

Reptiles

The grassland and hedgerow habitats onsite, and adjacent woodland habitat have the potential for common reptile species. It is therefore recommended a full suite of reptile presence / absence surveys should be undertaken between April and October inclusive, following the survey methods outlined in Froglife (1999)[9], which requires seven visits. If present, a method statement and associated mitigation (such as reptile exclusion fencing) may be required to ensure that reptiles are not impacted by any proposed works.

Great crested newt

Great crested newts (GCN) require ponds for breeding and a single pond is present on site. It is recommended that a habitat suitability index (HSI) assessment is undertaken of waterbodies within 500 m of the site in accordance with Oldham (2000)[10]. Depending on results GCN presence / absence surveys should be completed in accordance with Natural England guidance[11]. A method statement or mitigation licence from Natural England may be required for great crested newt (should they be present) prior to commencement of works.

Invertebrates

The site offers limited habitat for invertebrates of conservation interest, within the semi-improved grasslands and areas of dead wood. However, due to the limited extent of suitable habitat it is considered unlikely that the invertebrates present on site would constitute an assemblage of interest or nature conservation significance and as such further survey work is not considered necessary.

Author	Reviewer
……..	……..
Kelly Jones	Mark Linsley

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[9] Froglife (1999) Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation Froglife Advice Sheet 10.
[10] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus).* Herpetological Journal 10(4), 143-155.
[11] https://www.gov.uk/guidance/great-crested-newts-surveys-and-mitigation-for-development-projects

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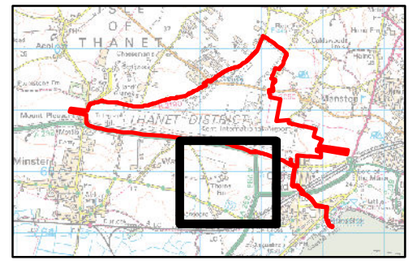
Key

- Site boundary
- Parkland and scattered trees-broad-leaved
- Intact hedge native species poor
- Defunct hedge native species-rich
- Broadleaved woodland - semi-natural
- Improved grassland
- Reedswamp
- Arable
- Hardstanding



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Client

RSP

Manston Airport DCO
EIA

amec foster wheeler

Figure 1
Extended phase 1 habitat map - Land parcel 1362

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Appendix 8.1

RiverOak Strategic Partners

Manston Airport, Kent

Hydrogeological Impact Assessment

December 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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RiverOak Strategic Partners
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This report has been prepared in a working draft form and has not been finalised or formally reviewed. As such it should be taken as an indication only of the material and conclusions that will form the final report. Any calculations or findings presented here may be changed or altered and should not be taken to reflect Amec Foster Wheeler's opinions or conclusions.

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Document revisions

No.	Details	Date
1	Draft Report	March 2017
2	Updated Draft	May 2017
3	Internal iteration	September 2017
4	Draft Final Report for Client comment	December 2017
5	Final Report for PIER II	January 2018

Contents

1. Introduction

1.1 Background to this Report

1.1.1.1 RiverOak Strategic Partners (RiverOak) is planning to reopen Manston Airport as a new air freight and cargo hub for the South East. This development site is located within the district of Thanet in the county of Kent, and is shown on Figure 1.1.

1.1.1.2 Manston Airport has been an airport for approximately 100 years, with the level of activity increasing significantly from the end of World War 2 in 1945, firstly as a military airfield and then more recently as the passenger airport. The airport has not been active since 2014. A full description of the proposed Manston Airport Development is provided in Chapter 3 of the Environmental Statement (ES). The Proposed Development over an area of approximately 3 km^2 shall consist of the following principal components:

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft
- an area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including;
  - a new Air Traffic Control (ATC) tower;
  - a fire station and fire safety training area;
  - a fuel farm; and
- facilities for other aviation-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;
  - a fixed base operation for executive travel; and
  - business facilities for aviation related organisations.

1.1.1.3 The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under Part 3 of the Planning Act 2008 (“the 2008 Act”) and therefore requires an application to be submitted for a Development Consent Order (DCO) under Section 14 of the 2008 Act. Under the 2008 Act this development constitutes a NSIP.

1.1.1.4 Environmental Impact Assessment (EIA) is required for certain developments under the EIA Regulations (refer to **Section 1.6** in **Chapter 1** for a definition of EIA). Some NSIPs always require EIA (the EIA Regulations define these under Schedule 1), others only require EIA if they are likely to have significant effects on the environment by virtue of their nature, size or location (the EIA Regulations define these in Schedule 2). In this instance, RiverOak is undertaking an EIA (in accordance with the EIA Regulations) under paragraph 10(e) of Schedule 2 because of the characteristics, location and potential impact of reopening Manston Airport.

1.1.1.5 The ES being prepared seeks to ensure that any potentially significant effects of the Proposed Development on the environment are identified and considered and, where appropriate, avoided, mitigated or compensated. EIA is required for certain developments under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations). RiverOak is therefore undertaking an EIA because of the characteristics, location and potential impact of reopening Manston Airport, to ensure that any potentially significant effects of the development on

the environment are considered and, where appropriate, mitigated. This is being undertaken as part of the Development Consent Order application for Manston Airport.

1.1.1.6 A Preliminary Environmental Information Report (PEIR) has been prepared by RiverOak (and consulted upon in summer 2017) by RiverOak as part of the consultation process, and the document addressed the various aspects of the environment including the water environment. Following the introduction of the 2017 Regulations a revised PEIR has been prepared reflecting the latest available information and introducing a number of additional topics second round of Preliminary Environmental Information Report consultation has been initiated to ensure all aspects are addressed required by the new guidelines.

1.1.1.7 A Hydrogeological Impact Assessment and Flood Risk Assessment have been prepared in support of the Freshwater Chapter of the Preliminary Environmental Information Report and will form part of the subsequent Environmental Statement (ES) to be submitted later in 2018. Under the Environmental Impact Assessment Regulations, "Preliminary environmental information" means information referred to in Schedule 4, Part 1 of the Regulations which has been compiled by the Applicant and is reasonably required to assess the environmental effects of the development and any associated development.

1.1.1.8 This HIA report provides information based on the development of the project and the data gathered up to the time of writing (December 2017) and reflects comments received following the first PEIR consultation in the summer of 2017 and subsequent discussions with consultees including the Environment Agency and Southern Water

1.1.1.9 The report presented here constitutes the HIA and has been prepared in support of the Freshwater Chapter of the Preliminary Environmental Information Report and subsequent Environmental Statement. It provides information based on the development of the project as described in Chapter 3 of the ES document and data gathered up to this point.

1.1.1.10 In undertaking this work particular attention has been paid to the Secretary of State's original comments on the Scoping Report which can be summarised as follows:

- A groundwater risk assessment should be undertaken in line with the Environment Agency's (EA's) "Groundwater Protection: Principles and Practice (GP3)".
- A quantitative risk assessment should be undertaken, unless robust justification can be provided otherwise.
- An assessment of the effects of the proposals on public and private water supplies should be undertaken. This should specifically consider effects and measures relating to trichloroethene (TCE).
- The scope of any intrusive works and associated mitigation measures are to be agreed with the EA, Thanet District Council (TDC) and Southern Water Services (SWS).
- The Applicant should ensure that the effect of the proposals on the objectives of the Water Framework Directive (WFD), as set out in the South East River Basin Management Plan (RBMP), are considered.

1.1.1.11 This HIA is considered to address the first three bullet points above. It should be noted that the EA's GP3 has been updated to "*The Environment Agency's Approach to Groundwater Protection*", issued in March 2017[1]. This was revised in November 2017 (Environment Agency 2017) and launched as part of new groundwater collection on GOV.UK and with a new position statement for a national quality mark scheme for land contamination management (NQMS).

1.1.1.12 The remaining two bullet points above are addressed in the separate Phase 1 Land Quality Assessment report (prepared as part of the ES) and the ES Freshwater Chapter respectively. It should be noted that no intrusive works have been permitted as part of this EIA work.

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/620438/LIT_7660.pdf

1.2 Consultation

1.1.1.13 RiverOak has consulted on the proposed development and has invited responses in relation to all elements of it, including that undertaken as part of the earlier non-statutory pre-application periods of consultation and engagement on the project.

1.1.1.14 In relation to the water environment and in particular the hydrogeological environment, consultation including meetings has taken place with the EA, SWS, Kent County Council (KCC) and TDC. A key consideration in these meetings has been the location of the site on a Principal Aquifer that is a source of public water supply (PWS).

1.1.1.15 Minutes of the various meetings are included in Appendix A. The Consultations have guided this assessment in that:

- Past hydrogeological assessments (by both the EA and SWS) mean that the further characterisation work is not required as the conceptual hydrogeological model is well understood.
- The primary concern is due to the proximity of the SWS public water supply source at The Lord of the Manor to the south east of the site. This source also has an adit that runs approximately west-east along the line of the existing runway, and has an attendant Source Protection Zone (SPZ). The potential risk to the Lord of the Manor PWS has been identified as the most important receptor to be considered in the risk assessment.
- The EA and SWS do not want to see any activity increasing the risk of contamination to the Lord of the Manor Source. The proposed new fuel farm has been identified as requiring particular assessment.
- SWS has indicated its preference that all drainage is positively removed off site rather than infiltrate the aquifer.
- The EA and TDC wish to be consulted on any site investigation work, should that be required and/or agreed.

1.2 Report Structure

1.2.1.1 The structure of this report has adopted the following structure to facilitate an assessment of its adherence to "*The Environment Agency's Approach to Groundwater Protection*", namely:

- Chapter 1 provides some background to the project and the range of reports that have been developed to address the requirements of the Planning Act 2008;
- Chapter 2 summarises the guiding groundwater protection principles and the legislative framework relevant to the HIA;
- Chapter 3 describes the hydrogeological environment ('the baseline');
- A quantitative risk assessment is presented in Chapter 4;
- Chapter 5 provides the conclusions and summary of the HIA;
- Appendix A includes details from consultations; and
- Appendix B provides details of the groundwater modelling work undertaken in support of the HIA.

1.2.1.2 This report refers to, and uses information collected as part of, the separate Phase 1 Land Quality Assessment (Amec Foster Wheeler 2017).

2. Groundwater Protection and Legislation

2.1 Introduction

2.1.1.1 This Chapter 2 summarises the guiding groundwater protection principles and the legislative framework relevant to the HIA. Groundwater protection is set out in the EA's original GP3 and updated in its latest approach to groundwater protection (Environment Agency 2017). Details of relevant legislation are given in the light of the hydrogeological setting of the development site.

2.1.1.2 Manston Airport is located in an area underlain by the Chalk aquifer (see Figure 2.1 below), otherwise referred to as the Thanet Chalk Block. The Chalk aquifer is designated by the EA as a Principal Aquifer. This means the aquifer is also capable of supporting water supply and/or river baseflow on a strategic scale. Further details on the hydrogeological environment are given in Chapter 3.

2.2 Protection of Groundwater

2.2.1.1 Groundwater supplies about one third of the mains drinking water in England. It also supports numerous private water supplies. In the Isle of Thanet public drinking water is supplied from groundwater.

2.2.1.2 Groundwater can have many benefits:

- It is water that generally needs little treatment prior to consumption, although on the Isle of Thanet groundwater has high nitrate levels and therefore does require some prior treatment.
- It provides water for rivers, wetlands and private water supplies. There are no rivers or wetlands within the development area. Coastal conservation sites lie to the north and south of Manston Airport (see Section 2.6). There are no private water supplies within a 2 km radius of the centre of the Manston Airport Site.
- It provides essential water for industry and agriculture. There are four abstractions for agriculture with 1 km of the site.

2.2.1.3 The presence of overlying layers of soil and rock often means that a groundwater aquifer such as the Chalk that underlies this site is relatively well protected from pollution compared with surface water. Water passing through these overlying layers is naturally filtered, and many pollutants are degraded and attenuated during its passage to the water table. However, once polluted an aquifer can be difficult and expensive to clean up.

2.2.1.4 The protection of groundwater is essential as any accidental spillage (for example liquid fuels) or the application of chemicals (e.g. fertilisers, pesticides etc.) to the ground has the potential to reach the water table. Whether it does or not will depend on the material involved and the ground conditions at the site. Care must also be taken to ensure that the overlying protective cover of soil and rock is not disturbed or removed.

2.2.1.5 The threats to groundwater are not just related to its quality but also its quantity. For example, over-abstraction of groundwater can deplete groundwater resources, such that they cannot support other existing or future abstractions. Many rivers and conservation sites also depend on groundwater and may be harmed or lost if groundwater levels become too low. A decline in water levels can itself lead to a deterioration in groundwater quality, as saline or poor quality water can be drawn in from the sea or from at depth.

2.2.1.6 The Manston Airport development poses a potential risk to groundwater through pollution arising from the planned site activities or from the mobilisation of existing historical contamination during site works. Furthermore, these works could also increase the risks to groundwater by removing some aquifer material and/or the overlying protective cover of soil and rock.

2.2.1.7 The Manston Airport development would not require a groundwater abstraction and therefore there is no direct threat to the quantity of water available to nearby abstractions and conservation sites. An indirect effect may arise through the reduction in rainfall recharge due to the increase in paved area across the airport. The current paved area (96 hectares (Ha)) is approximately 6% of the catchment area (16 km^2) to the Lord of The Manor source, and the re-developed site will have a paved area of approximately 132 Ha, approximately 8% of the catchment area.

2.2.1.8 The approach to protecting groundwater is set out in "*The Environment Agency's Approach to Groundwater Protection*" (Environment Agency 2017). The EA's priority is to protect water supplies intended for human consumption, as well as ensure protection of groundwater quality that supplies dependent ecosystems. This is achieved under the WFD (see Section 2.3), and the approach seeks to apply progressively more stringent controls as the sensitivity of the location increases (for example, applying greater controls the closer an activity is to an abstraction source).

2.2.1.9 Certain activities may present a particular hazard to groundwater due to a combination of the activity type, its duration and the potential for failure of measures taken to mitigate environmental impacts. Depending on the potential severity of the hazard, the EA may object (through planning or permitting controls) to such activities in certain areas. Close to sensitive receptors, the EA is likely to adopt the 'precautionary principle' as even where the likelihood of pollution occurring is not high; the consequences may be serious or irreversible.

2.3 Legislative and Regulatory Framework

2.3.1 Introduction

2.3.1.1 The control and protection of groundwater is covered by legislation and a series of guidance and policies issued by the EA. Relevant legislation includes, but is not necessarily limited to, the following (in approximate chronological order, most recent legislation first):

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017;
- The WFD (Standards and Classification) Directions (England and Wales) 2015;
- The Water Environment (WFD) (England and Wales) Regulations 2017;
- The Environmental Permitting (England and Wales) Regulations (EPR) 2010 together with subsequent amendments;
- Floods and Water Management Act 2010;
- The European Union (EU) Floods Directive (2007/60/EC), as enacted into domestic law by the Flood Risk Regulations 2009;
- Priority Substances Directive (2008/105/EC), as enacted into domestic law in 2010;
- The EU Water Framework Directive (2000/60/EC) (WFD), as enacted into domestic law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003;
- Water Act 2003;
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017;
- Environment Act 1995;
- Land Drainage Act 1991;
- Water Resources Act, 1991;
- Environmental Protection Act 1990; and
- Control of Pollution Act 1974.

2.3.1.2 In addition, a range of policies and general good practice advice and technical guidance are of relevance to this assessment, including the following:

- Pollution Prevention Guidance Notes (PPG), which, whilst withdrawn by the EA, provide a good summary of environmental good practice measures which will demonstrate compliance with legislation for protection of the water environment;
- "*The Environment Agency's Approach to Groundwater Protection*" and its predecessor GP3;
- CIRIA Report C532: Control of water pollution from construction sites;
- CIRIA Report C648: Control of water pollution from linear construction projects – technical guidance;
- CIRIA Report C649: Control of water pollution from linear construction projects – site guide;
- CIRIA Report C692: Environmental good practice on site (third edition);
- CIRIA Report C698: Site handbook for the construction of SuDS;
- CIRIA Report C753: The SuDS manual; and
- Environment Agency (2001) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention. NC/99/73.

2.3.1.3 The key legislation and guidance/policies relevant to the Manston Airport proposed development are discussed in the following sections.

2.3.2 Key Legislation

Water Resources Act 1991

2.3.2.1 Section 93 of the Water Resources Act 1991 allows for the designation of statutory water protection zones (WPZs) (for groundwater or surface waters). These may be designated to prohibit or restrict the carrying out of activities that are giving rise to the entry of poisonous, noxious or polluting matter into groundwater or surface waters and which present a risk of pollution. They may also be used to impose requirements on persons who carry out activities in the zone to take such steps as may be specified or described by the defined WPZ.

WFD (2000/60/EC)

2.3.2.2 Under the WFD, the EA has produced nine RBMPs for England to manage water quality targets and river basin planning. These were updated during 2015. One of the aims of the WFD is for all water bodies to achieve Good Ecological Status[2] by 2027 and to ensure no deterioration from current status.

2.3.2.3 Article 7.1 of the WFD requires member states to formally delineate water bodies that are used for the abstraction of drinking water, called drinking water protected areas (DrWPAs). All groundwater bodies in England and Wales are classified as DrWPAs due to the low abstraction thresholds set in the WFD. Article 7.2 stipulates that the requirements of the Drinking Water Directive must be met; in England and Wales, and this is the responsibility of the Drinking Water Inspectorate. Article 7.3 requires the protection of these water bodies "*with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water*". Safeguard zones can be established for this purpose if required.

[2] Ecological Status is classified in all WFD water bodies, expressed in terms of five classes (high, good, moderate, poor or bad). These classes are established on the basis of specific criteria and boundaries defined against biological, physico-chemical and hydromorphological elements. The overall Ecological Status of a water body is determined by whichever of these assessments is the poorer. For example, a water body might pass 'Good Status' for chemical and physico-chemical assessments, but be classed as 'Moderate Status' for the biological assessment: In this case it would be classed overall as 'Moderate Ecological Status'. http://evidence.environment-agency.gov.uk/FCERM/en/SC060065/About.aspx

2.3.2.4 Although the Article 7 objectives apply across a groundwater body, the point of compliance for Article 7.3 is at the point of abstraction. This means that applying protection measures equally over the entire land area of the DrWPA is not necessary to meet this objective.

2.3.3 Key EA Guidance/Policies

WFD Groundwater Body

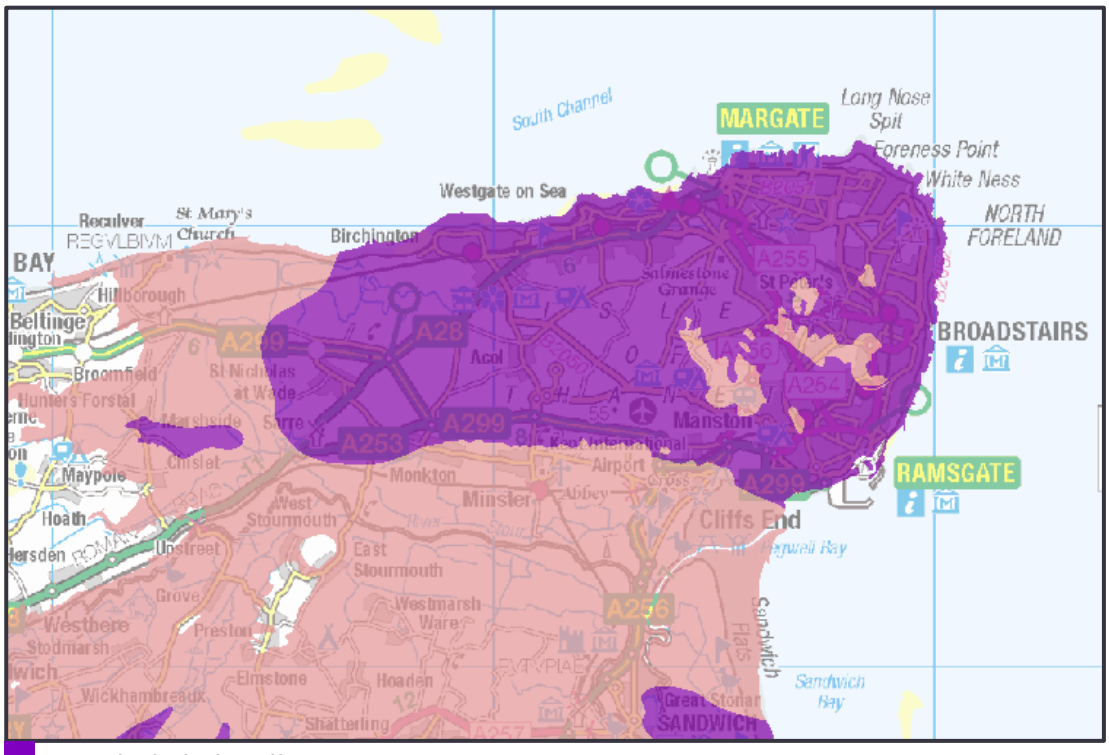
2.3.3.1 Under the WFD, the EA has produced nine RBMPs for England to manage water quality targets and river basin planning. These were updated during 2015. The Manston Airport site is located within the South East River Basin District.

2.3.3.2 The Manston Airport site is located within the Kent Isle of Thanet Chalk groundwater body (within the East Kent Chalk and Tertiaries Operational catchment). The overall 2015 water body is of poor status (as a result of poor status for both quantitative and chemical components), with an overall water body objective to achieve good by 2027. Attaining the default (good status) is not justified under WFD because the costs of the measures exceed the benefits for the quantitative component. However, the chemical component has an objective to reach Good status by 2027. To achieve this the WFD highlights improvements in relation to the area's Chemical DrWPA and General Chemical Test. These measures would be unaffordable to implement within a particular timetable (in advance of 2027) without creating disproportionate burdens for particular sectors or parts of society, or any identified solution would be at odds with the 'polluter pays' principle.

Aquifer Status

2.3.3.3 Figure 2.1 shows the extent of the Chalk aquifer in the Isle of Thanet. The aquifer is designated by the EA as a Principal Aquifer. This means that the Chalk has a high intergranular and/or fracture permeability, implying that it potentially provides a high level of water storage. The aquifer is also capable of supporting water supply and/or river baseflow on a strategic scale. As mentioned earlier, the Chalk aquifer is the only supply of drinking water to this part of North Kent.

Figure 2.1 Outcrop of Chalk Principal Aquifer.



Area of Principal Aquifer

Ref: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=groundwater&layerGroups=default&lang=_e&ep=map&scale=5&x=531500&y=181500#x=631420&y=166630&lg=3,&scale=6

Source Protection Zones

2.3.3.4 There are four PWSs that make up the abstraction group within the Thanet Chalk Block, namely Lord of the Manor, Minster B, Sparrow Castle and Rumfields.

2.3.3.5 The Manston Airport site is located entirely within a groundwater SPZ catchment (Figure 2.2). The inner zone (SPZ1), where contamination from site activities would present greatest risk to a PWS, is identified in an area at the eastern end of the site and in a strip beneath the runway, and is coincident with the line of the Western Adit feeding the Lord of The Manor PWS. This is surrounded by a wider area of outer zone (SPZ2) that also dominates the area beneath the runway, in the south of the site. The remainder of the site falls within the wider SPZ catchment area (SPZ3).

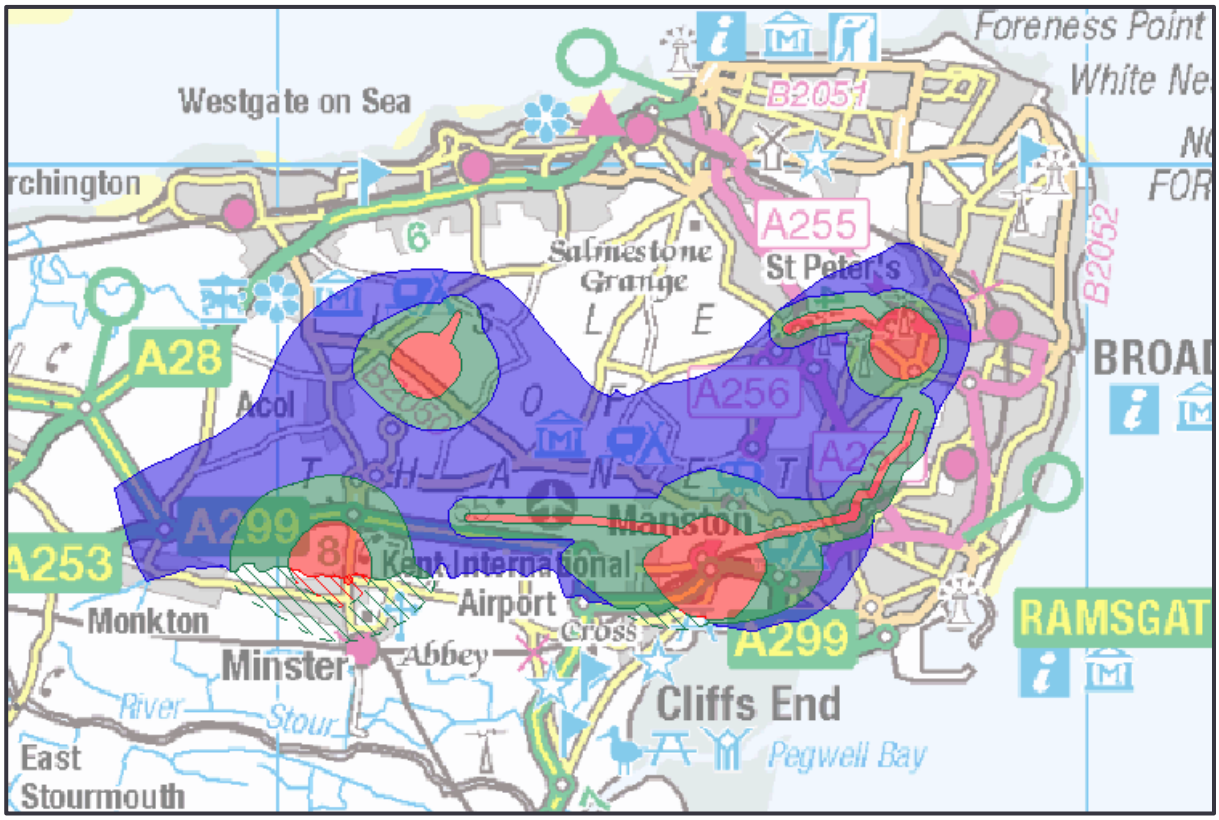
2.3.3.6 Table 2.2 lists those activities not permitted within a SPZ1.

2.3.3.7 The EA also seeks to restrict activities in SPZ2, in particular:

- Non-nationally significant infrastructure schemes;
- Pipelines and high voltage fluid filled cables;
- Sub water table storage;
- Landfill locations; and
- Burials close to water supply used for human consumption or farm dairies where carcasses present a risk of disease transmission into groundwater

2.3.3.8 SPZ3 (the source catchment protection zone) is defined as the area around an abstraction source within which all groundwater can potentially feed into the abstraction source. Although no specific activities are identified as being not permitted, the EA would look for appropriate precautions to be adopted for any activity in SPZ3 to ensure the prevention of pollution of groundwater and protection of it as a resource.

Figure 2.2 Designated SPZ



Ref: http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=531500.0&y=181500.0&topic=groundwater&ep=map&scale=5&location=London,%20City%20of%20London&lang=_e&layerGroups=default&distance=&textonly=off#x=634117&y=166969&lg=1,10,&scale=7

Inner zone (Zone 1) - Defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres;

Outer zone (Zone 2) - Defined by a 400 day travel time from a point below the water table. The previous methodology gave an option to define SPZ2 as the minimum recharge area required to support 25 per cent of the protected yield. This option is no longer available in defining new SPZs, and instead this zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction;

Total catchment (Zone 3) - Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Total Catchment Zone (TCZ) can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75. There is still the need to define individual source protection areas to assist operators in catchment management.

Table 2.1 Activities not permitted within a SPZ1 (based on EA GP3)

The following have been amended in light of the 2017 update.	
Infrastructure	Non-nationally significant infrastructure schemes Transport developments Pipelines and high voltage fluid filled cables Underground coal gasification, coal bed methane and shale gas extraction Oil and conventional gas exploration and extraction
Storage of pollutants	Underground storage (and associated pipework) Sub water table storage
Landfill	Landfill location
Other waste activities	Non-landfill waste activities
Discharge of liquid effluents into the ground	Sewage effluent discharges inside SPZ1 Trade effluent and other discharges inside SPZ1 Cesspools and cesspits Sewerage pipework Discharge of clean roof water to ground Sustainable drainage systems
Diffuse sources	Land spreading Livestock housing Storage of organic manures on farms
Cemetery developments	Siting cemeteries close to a water supply used for human consumption Mass casualty emergencies Cemeteries: Protecting groundwater in highly sensitive locations
Burial of animal carcasses	Burials close to water supply used for human consumption or farm dairies On-farm carcass burials
Managing groundwater resources	Physical disturbance of aquifers in SPZ1*
Ground source heating and cooling	If a developer proposes to use hazardous substances for a GSHC system in a sensitive location such as a SPZ1, the Environment Agency may serve a notice to prevent pollution.

Notes *this is taken to mean the saturated part of the aquifer

2.3.3.9 The EA's GP3 guidance has recently been updated (Environment Agency 2017), and there are a number of relevant position statements in the new guidance, including the following:

C1 Nationally or regionally significant schemes

The EA requires the promoters of schemes of national or regional significance to protect groundwater when choosing the location for their activity or development. In the cases where this is not possible due to national or regional interests, the EA expects to be fully involved in the scheme development to mitigate groundwater risks via EPR where applicable. Promoters are expected (via the environmental impact assessment process) to identify all the potential pollution linkages and apply best available techniques to mitigate the risks.

C2 Non-nationally significant infrastructure schemes

In SPZ1 and SPZ2, the EA will only agree to proposals for infrastructure developments of non-national significance where they do not have the potential to cause pollution or harmful disturbance to groundwater flow or where these risks can be reduced to an acceptable level via EPR if applicable.

2.3.3.10 Where the EA judges there to be an unacceptable risk to groundwater from the storage of pollutants or their transmission through associated pipework, it will normally oppose such storage or transmission. If other material planning considerations determine that the development should proceed, the EA expects best available techniques (BAT) to be applied.

D2 - Underground storage (and associated pipework)

The EA will normally object to new and increased underground* storage of hazardous substances in SPZ1. The EA will agree to such storage in Principal and Secondary aquifers outside SPZ1 only if there is evidence of overriding reasons why the:

- activity cannot take place within unproductive strata
- storage must be underground (for example public safety), in which case it is expected that the risks are appropriately mitigated

Where such storage already exists the EA will work with operators to assess and if necessary mitigate the risks, including an aim to change to above ground storage.

The EA will normally object to any redevelopment scheme involving retention of underground storage of hazardous substances in SPZ1 unless it can be demonstrated that risks to groundwater can be adequately mitigated.

For all storage of pollutants underground (hazardous substances and non-hazardous pollutants), the EA expects operators to adopt appropriate engineering standards and have effective management systems in place. These should take into account the nature and volume of the materials stored and the sensitivity of groundwater, including the location with respect to SPZs.

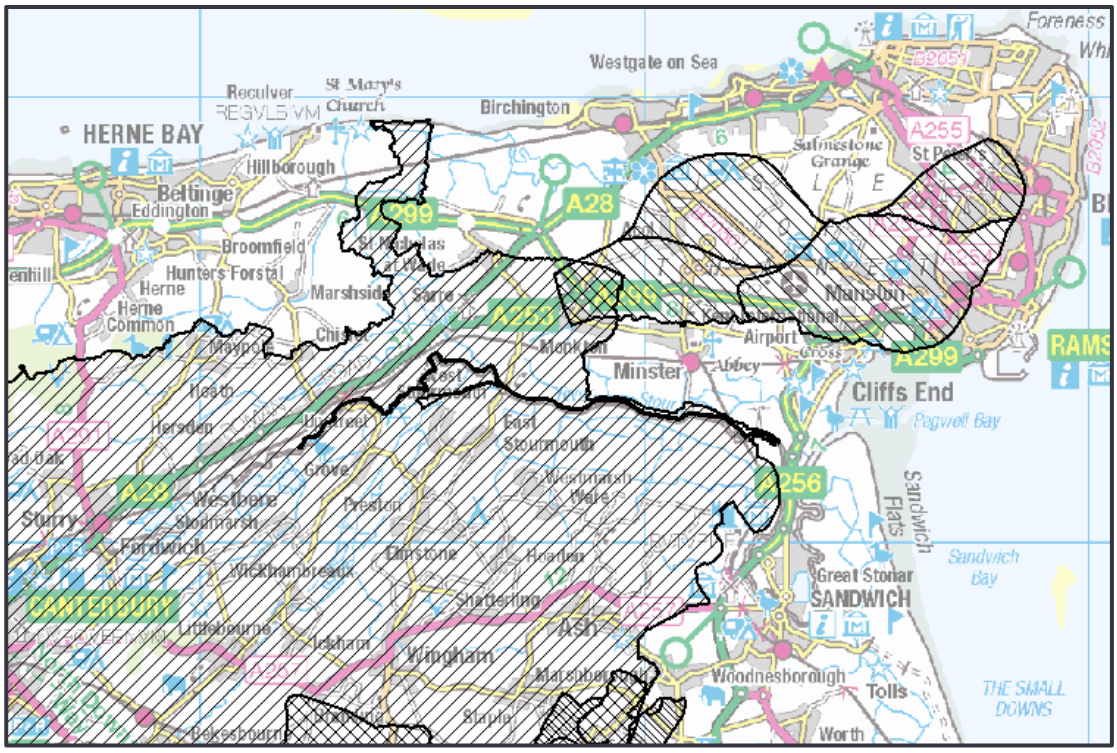
Safeguard Zones/ DrWPAs

2.3.3.11 The EA has indicated that for those ‘at risk’ DrWPAs it will establish a Safeguard Zone (SGZ). These non-statutory zones are areas where activities can impact adversely on the quality of water abstracted in the DrWPA. Action to address pollution is targeted in these zones so that extra treatment of raw water can be avoided. SGZs are a joint initiative between the EA and water companies. SGZs are one of the main tools for delivering the DrWPA objectives of the WFD. The EA also state “*Drinking water safeguard zones are designated areas in which the use of certain substances must be carefully managed to prevent the pollution of raw water sources that are used to provide drinking water*”. These zones are generally areas where the land use is causing pollution of the raw water.

2.3.3.12 In order to protect water resources, the EA wants to ensure that activities do not result in pollution leading to the need for more treatment. The identification of SGZs for any raw water sources that are ‘at risk’ of deterioration should result in the need for less additional treatment.

2.3.3.13 In 2015 a SGZ (Reference GWSGZ0115) around Manston was defined by the EA (Figure 2.3). The zone was primarily set up with respect to nitrate and solvents. Currently SWS, as part of its National Environment Programme (NEP) focused on the DrWPAs in the Thanet area, is investigating the possible sources and pathways of groundwater pollution, specifically from nitrate and solvents. This work may lead to an update and redefinition of the SGZ.

Figure 2.3 Safeguard Zones North Kent

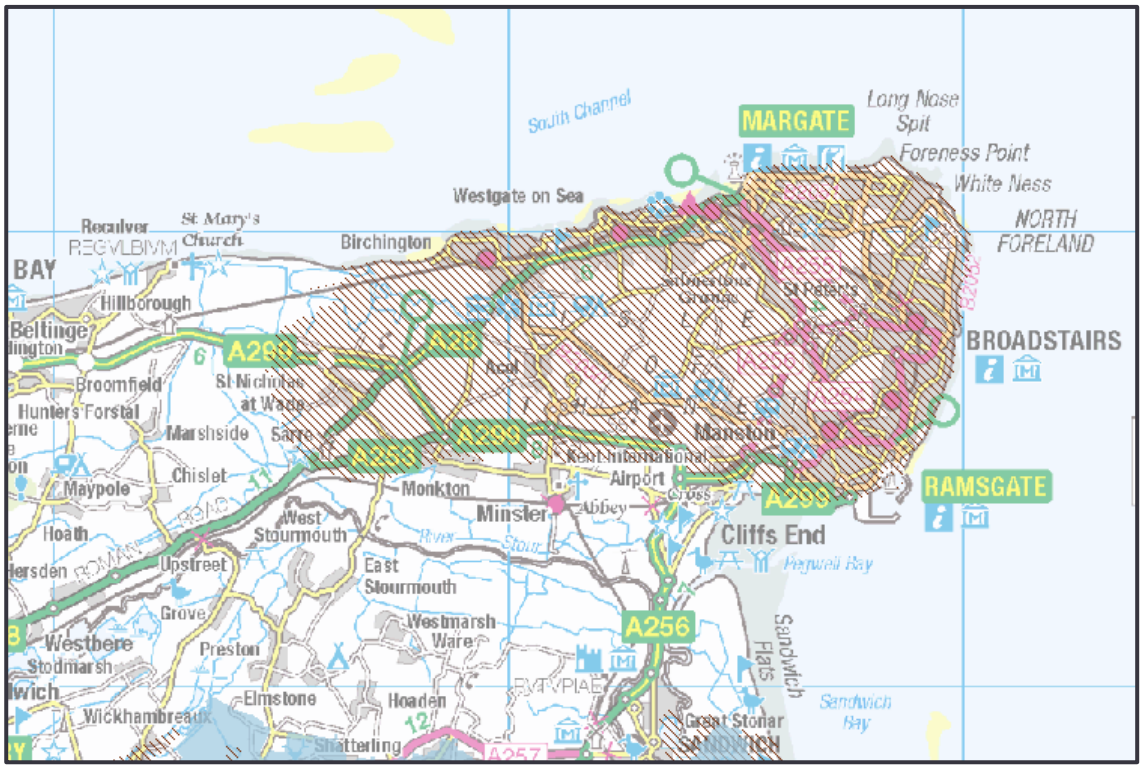


Ref: http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=drinkingwater&layerGroups=default&lang=_e&ep=map&scale=5&x=531500&y=181500#x=628093&y=163713&lg=2,3,&scale=6

Nitrate Vulnerable Zones

2.3.3.14 Figure 2.4 shows the extent of the nitrate vulnerable zone (NVZ) for the Thanet Chalk Block. This confirms that the major issue with groundwater quality in this area is the high level of nitrate.

Figure 2.4 Nitrate Vulnerable Zone



Ref http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=nvz&layerGroups=default&lang=_e&ep=map&scale=6&x=631420&y=166630

2.4 Habitats Regulations Assessment (HRA)

2.4.1.1 The north coast of the Isle of Thanet, located approximately 3.5 km north of the site, is designated as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protected Area (SPA) and RAMSAR site. In closer proximity to the Manston Airport site are Sandwich and Pegwell Bays, located 1.5 km to the south east. Together these bays are part of designated National Nature Reserve (NNR), RAMSAR, SSSI, SPA and SAC sites, which are described more fully in Chapter 7: Biodiversity of the PEIR report. The proposed Manston Airport development site has been identified as falling within the associated SSSI risk zones for Sandwich and Pegwell Bays.

2.4.1.2 Implementing the WFD contributes to outcomes for nature conservation and biodiversity by improving the water environment. The RMBPs include a summary of the measures needed for water-dependent Natura 2000 sites to meet their conservation objectives. Supporting Site Improvement Plans (SIPs) provide an overview of the issues (both current and predicted) affecting the current condition and outlines the priority measures required to improve the condition of the features. Sandwich Bay SAC, Thanet Coast and Sandwich Bay SPA and Thanet Coast SAC are water-dependent and fall under the North East Kent (Thanet) SIP.

2.4.1.3 Measures for the Thanet Coast SAC and Sandwich and Pegwell Bay SPA were completed in 2015 to enable conservation objectives to be met according to the SIP. For Sandwich Bay SAC the measures will be complete by 2027, and require implementation of management actions to address and adapt to changes in water levels affecting sand dune vegetation.

2.4.1.4 The assessment of potential effects on these sites covered by the HRA are to be addressed in the Chapters 7 (Biodiversity) and 8 (Freshwater Environment) of the PEIR (to which this report is going to be an appendix), and there is also a requirement under The Conservation of Habitats and Species Regulations 2010 (SI 2010 No. 490) (the 'Habitats Regulations') to undertake a screening exercise to determine whether this (or any other) site is likely to be significantly affected by the proposed development, either alone or in combination with other plans and projects. If significant effects are likely, there will be a need for an Appropriate Assessment to be carried out. The

screening, any Appropriate Assessment and subsequent assessment form part of what is known as the Habitats Regulations Assessment (HRA), which will form an appendix to the ES.

2.4.1.5 Screening and any subsequent Appropriate Assessment will be undertaken by PINS (the 'Competent Authority'), drawing upon information regarding the likely effects of the proposed development on European sites that is provided by RiverOak. In undertaking its assessment, PINS is required to consult with Natural England (NE). To facilitate the process, Amec Foster Wheeler will also liaise with NE, and other interested parties as appropriate in the preparation of an Evidence Plan for the HRA.

2.5 Planning Policies

2.5.1.1 Relevant national and local planning policies are summarised in Table 2.2.

Table 2.2 Summary of key national and local planning policies

Draft Airports National Policy Statement (NPS): new runway capacity and infrastructure at airports in the South East of England, February 2017	Land use including open space, green infrastructure and Green Belt (Section 5.109): Construction and operation of airport facilities is a potential source of contaminative substances (for example, through de-icing or leaks and spills of fuel). Where pre-existing land contamination is being considered through development, the objective is to ensure that the site is suitable for its intended use. Risks require consideration in accordance with the contaminated land statutory guidance as a minimum. Water quality and resources (Sections 5.163 and 5.164): Section 5.163: Development may result in an increased potential for impacts on the water environment, especially the quality of the surface and groundwater through the discharge of waters contaminated with de-icer along with hydrocarbons and other pollutants. Section 5.164: The Applicant should make sufficiently early contact with the relevant regulators, including the EA, for abstraction licensing and environmental permitting, and with the water supply company likely to supply the water. Where the proposed development is subject to an EIA and the development is likely to have significant adverse effects on the water environment, the Applicant should ascertain the existing status of, and carry out an assessment of, the impacts of the proposed project on water quality, water resources and physical characteristics as part of the environmental statement.
Draft Thanet Local Plan to 2031, January 2015. Policy SE04: Groundwater Protection Zones	Proposals for development within the groundwater SPZs identified on Thanet's groundwater protection zones map will only be permitted if there is no risk of contamination to groundwater sources. If a risk is identified, development will only be permitted if adequate mitigation measures can be implemented. Proposals for sustainable drainage systems involving infiltration must be assessed and discussed with the EA to determine their suitability in terms of the impact of any drainage on the groundwater aquifer.

3. Hydrogeological Environment

3.1 Introduction

3.1.1.1 This Section describes the hydrogeological 'baseline' environment, which provides the benchmark against which the HIA is undertaken.

3.1.1.2 As stated in Chapter 2 above, the Manston Airport site sits within an area of Chalk aquifer referred to as the Thanet Chalk Block. The hydrogeological environment of the Thanet Chalk Block has been the subject of a number of past studies by both the EA and SWS. These studies have primarily focussed on the assessment of the cause of high nitrate levels in the groundwater and the prediction of future trends.

3.1.1.3 The results of these studies have been made available to this HIA, and the baseline hydrogeological environment can therefore be described with a high level of confidence. Discussions with the EA and SWS have confirmed that no additional work is required to understand the groundwater environment in the vicinity of Manston Airport and the nearby Lord of the Manor PWS. However, further site investigation may be required to confirm aspects of the land quality.

3.1.1.4 The site setting and underlying geology is described below, followed by details regarding the hydrogeology including the catchment characteristics. Details are also given with respect to the groundwater quality, in particular relating to the Lord of the Manor source.

3.2 Site Setting and Description

3.2.1 Introduction

3.2.1.1 Background hydrogeological information has been provided by SWS in the form of a number of reports (Aquaterra, 2007; Atkins, 2014 and 2015; Mouchel, 2007 and 2008, Amec Foster Wheeler 2017(b)). Relevant details from the reports have been included in the following sections.

3.2.2 Catchment Characterisation and Delineation

Catchment Characterisation

3.2.2.1 Topographically the catchment covers the highest part of the Isle of Thanet, with most land above the 40 metres Above Ordnance Datum (mAOD) surface contour, sloping gently downwards towards the north and Westgate, and more steeply descending in the south at Cliffs End. An east-west trending ridge of land higher than 50 mAOD sits between Telegraph Hill and Manston Golf Course. From this ridge, two topographic lows, possibly dry valleys, extend to the north from Manston Golf Course towards Lydden and Fleete, and to the south towards Pegwell Bay. The airport site itself has an elevation of around 49-50 mAOD both with slightly higher ground in the southern and northern parts of the site but steps down towards Manston Road to 41 m AOD.

3.2.2.2 The catchment to the Lord of the Manor PWS is predominantly rural, with areas of urban and suburban land to the west on the outskirts of Ramsgate. Agricultural census data for 2010, combined with Ordnance Survey (OS) mapping, indicates that the Lord of the Manor catchment is made up of 43% urban and suburban land and 42% agricultural land (of which the predominant crops are wheat and other cereals such as barley and peas and beans and brassicas). The remaining 15% of land area comprises roads (8%), rough grazing and woodland. In the south west of the catchment, the runway and apron of Manston Airport sit over the Western Adit, whilst the London – Ramsgate railway line, including a tunnel section, follows the line of the Eastern Adit into Ramsgate.

3.2.2.3 The main changes in the land-use in the catchment between the 1930s land utilisation survey and the current day are the expansion of Ramsgate towards the west and the marked increase in

agricultural activity that occurred in the 1920s with the conversion of meadowland/grass to arable. Changes have seen the ploughing up of orchards and conversion of land to market gardening and the establishment of high concentrations of brassica crops (cauliflowers in particular) and other intensive farming activities.

Catchment Delineation

3.2.2.4 Recent work on behalf of SWS (Amec Forster Wheeler, 2017) using the Flowsource software (© Groundwater Science) and the East Kent groundwater model has delineated the catchment area to the Lord of the Manor PWS based on a recent actual abstraction rate of 3.5 Ml/d. The TCZ to the PWS covers an area of 16 km^2, and extends from Chalkhole Farm in the north, to Alland Grange in the west, and Newlands Farm, on the outskirts of Ramsgate, in the east (Figure 3.1).

3.2.2.5 An inner zone (SPZ1) for the Lord of the Manor PWS based on a 50 day travel time to the borehole has been defined and is extended to include the adits (see Figure 2.2 above). An outer zone based on the area of the catchment contributing 70% of the abstracted volume covers a similar area to the TCZ.

3.2.3 Topography and Drainage

3.2.3.1 The Isle of Thanet comprises an area extending approximately 12 km east-west by 4.5 km north-south in the west and 9 km north-south in the east. It is bordered by the sea to the north, east and south east, and by the River Stour to the south west and the River Wantsum to the west (see Figure 3.1.)

3.2.3.2 The Isle consists of a plateau that slopes gently westwards from the 30 m high cliffs at the coast to an elevation of 10 mAOD in the west, at the edge of the River Stour valley. The flat expanse of the River Stour valley is generally at only 2 mAOD, but in some areas is below sea level.

3.2.3.3 The Manston Airport site is on relatively high ground, mainly at an elevation of between 45-50 mAOD. The southern portion is at an elevation of approximately 50 mAOD, along the length of the existing runway, but rises to approximately 55 mAOD in the westernmost corner of the site. North of the runway the site level declines to approximately 40 mAOD in the west, at the Spitfire Way Junction (crossroads of the Manston Road (B2050) and Spitfire Way (B2190) carriageways), forming the start of the headwater valley for the Brooksend Stream, while remaining at 45-50 mAOD in the northernmost part of the site. The site also encompasses the line of the buried pipeline to Pegwell Bay, which extends from the southern portion of the site at about 50 mAOD to the outfall point in Pegwell Bay.

3.2.3.4 The average annual rainfall recorded at Manston between 1981 and 2010 was 592.5 mm (Source: Meteorological Office). There are no rivers or watercourses on or adjacent to the site, partly due to the high permeability of the underlying Chalk. A series of water channels and streams that form part of the Minster Marshes are located more than 1 km to the south of the site. The buried pipeline lies in closer proximity to the north western extent of this system, but aerial photography indicates that it does not cross any surface water features. Minster Marshes drain south into the River Stour, 3 km south of the site, which flows east and into Sandwich and Pegwell Bays.

3.2.3.5 OS mapping indicates a drainage channel on the opposite side of the road at the northernmost point of the site. This is possibly associated with an operational garden nursery (Rosemary Nurseries) adjacent to the site.

3.2.3.6 OS mapping indicates a number of water reservoirs within 3 km of the site. A number of small uncovered reservoirs are located approximately 1.5 km or more from the westernmost boundary of the site. A covered reservoir is located approximately 0.5 km north of the site, and one further uncovered reservoir is located 0.3 km from the southern boundary.

3.2.3.7 There are a number of other small water features (e.g. ponds) located within 3 km of the site.

3.2.4 Soils and Land Use

3.2.4.1 The LANDIS soils database indicates that the site is underlain by slightly acid and lime rich, loamy soils that are freely draining. The leaching potential of the soils indicates that they have the potential to transmit a wide range of pollutants.

3.2.4.2 Although Manston Airport ceased operation in 2014, the remnant land use across the site remains. The southern part of the site is dominated by the tarmac runway, with a network of roads and taxiways linking this to the northern parts of the site. Carparks and buildings across the site remain, and all the infrastructure is surrounded by cleared, maintained grass areas.

3.2.4.3 The site is bordered by roads that run along the length of the southern and western boundaries, with the B2050 cutting across the site in the north. Beyond these roads are farmland and industrial/retail areas (including Manston Fire Museum). To the north and east of the site are areas of farmland and residential dwellings.

3.2.5 Geology

3.2.5.1 The Isle of Thanet is underlain by the middle sequence of the Upper Chalk Formation (White Chalk sub-group), which is part of the North Downs outcrop that extends from the west near Guildford in Surrey to the Isle of Thanet on the east coast of England. The outcropping Chalk units are the upper Newhaven Chalk (previously the Margate Chalk), the Seaford Chalk and underlying Lewes Nodular Chalk. The total thickness of the Chalk in the North Downs of East Kent is between 237 m (at Margate) and more than 275 m at the southern limit of the Margate Chalk outcrop. The geology, superficial deposits and bed rock, is shown in Figures 3.2a and 3.2b respectively.

3.2.5.2 The Seaford Chalk occurs at the coast and is a soft, blocky white chalk with seams of small to very large flint nodules. The overlying Newhaven Chalk underlies most of the Isle of Thanet, and is composed mainly of smooth white chalk without marl seams and with few flint bands

3.2.5.3 The Chalk is underlain by Gault Clay and overlain by the Lower London Palaeogene Group, comprising the Thanet Formation, Lambeth Group and Thames Group. These formations are sands, silts and clays with pebbles and flint, but have not been confirmed as across the airport site itself.

3.2.5.4 The structure underlying the Isle of Thanet is an anticline/monocline striking east-west and facing south to south west. The steepest exposed part of the anticline occurs in Pegwell Bay on the east of the Isle, and dips at 10 degrees to the south south west.

3.2.5.5 Local to the Manston Airport site the underlying bedrock is the Chalk dipping to the south, and trial pits recorded on the British Geological Survey (BGS) website[3] indicate that the Chalk is present at a very shallow (~1 m) depth. Although mapped to the north east of the site, the Thanet Formation was not encountered in the trial pits across the site, although could potentially be located beneath the north east part of the site.

3.2.5.6 Head Deposits (mainly interglacial wind-blown sands with clay and silt) were found in trial pits in the centre and east of the site. The BGS mapping shows Head Deposits along the northern part of the site. The Head Deposits are overlain by Made Ground in the form of fill material with cinders, chalk, and building rubble. This material was recorded in trial pits in the centre and north of the site, but is potentially located across the majority of the site due to the site's historical use. Dark grey sandy topsoil was found in the trial pits in the centre, north and east of the site.

3.3 Hydrogeology

3.3.1 Aquifer Status and Water Levels

3.3.1.1 The Principal aquifer under the Isle of Thanet is the Chalk that has an area of approximately 86 km^2 (BGS, 2008). It is considered that the upper 70 m or so of the Chalk is the productive zone of

[3] http://mapapps.bgs.ac.uk/geologyofbritain/home.html

the aquifer, and this assumption is supported by the majority of the public abstraction sources in the area having adits with levels located at about 2 to -4 mAOD (40-50 metres below ground level, mbgl).

3.3.1.2 The overlying Thanet Formation is classified by the EA as a Secondary Aquifer A (permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers). It is not believed to be in hydraulic continuity with the Chalk, and although in the vicinity of the site it is unsaturated, the Thanet Formation may act as a semi confining unit to the Chalk at the southern and western margins of the aquifer (Atkins, 2014). However, it is a relatively thin and non-continuous formation. The base of the Chalk is defined by the low permeability Gault Clay Formation. (a rock layer with low permeability that has negligible significance for water supply or river base flow).

3.3.1.3 The water table within the Chalk is generally a subdued reflection of the surface topography. A groundwater mound has formed to the north west of Ramsgate, coincident with the Chalk anticline (Atkins, 2014). Generally groundwater flow radiates outward from beneath the central topographically high towards the coast and to a lesser extent towards the Rivers Stour and Wantsum. Faults, joints and topographic features which may control drainage and infiltration are also likely to play a role in directing the flow of groundwater more locally.

3.3.1.4 Figure 3.3 shows groundwater level contours based on the work undertaken for SWS by Atkins (2014). The figure shows that in the central part of the Thanet Chalk Block the water table is generally around 10 mAOD, which corresponds to an unsaturated zone thickness of greater than 30 m (Southern Water Authority (SWA), 1985). At the coast the unsaturated thickness reduces to a few metres, whilst seasonal fluctuations in groundwater levels in the block are small (1–5 m) and dampened at low elevations. As Atkins note, however, the groundwater contours should be treated with caution, in particular the apparent groundwater mound in the east of Thanet, and are just one possible interpretation of the data.

3.3.1.5 Water level records for observation boreholes (OBHs) on the Isle of Thanet suggest that the fluctuation in groundwater levels in response to rainfall recharge becomes more pronounced towards the centre of the Thanet Chalk Block and the topographic high on which the Airport sits, with a seasonal change in water table level of up to 5 m at Alland Grange and Fleete Reservoir compared to 0 to 2 m at the edges of the Chalk to the south of the catchment. Comparison of the groundwater level data at the Lord of the Manor well with topography suggests that the unsaturated zone during the operation of this PWS is around 30 m to 35 m thick. The presence of the Western Adit may lead to a flattening in groundwater levels down gradient to the south, as it acts as a sump to the southerly flowing groundwater.

3.3.1.6 It is possible that perched water occurs within the Thanet Formation or above low permeability layers within the Thanet Formation. As stated earlier, the Thanet Formation is not thought to be present across the airport site. In addition shallow perched water may occur in the Head Deposits or areas of Made Ground if low permeability horizons are present.

3.3.1.7 Work associated with the EA's East Kent groundwater model (Mott MacDonald 2006) shows that the winter peak in groundwater levels is typically in April, whereas the estimated percolation from the soil zone into the Chalk is highest in November to January i.e. there is a delay of three to four months associated with recharge through the unsaturated zone. It is clear that the low recharge values of 146 to 175 mm/a (Entec 2010), together with the substantial unsaturated zone thickness over most of the area, mean that movement of recharge (and therefore pollutants) through the unsaturated zone is generally slow. The rate of movement of water through the unsaturated zone in the main body of the Chalk has been estimated at 0.5 m/a based on pore water profiles (Southern Water, 1985).

3.3.1.8 In contrast, the EA[4] has evidence for occasional short term responses (in the order of a few days) to individual summer storms, indicating a recharge contribution via fast fissure pathways. This range of responses reflects the complex matrix and fissure flow processes in the unsaturated zone

[4] Meeting with EA Monday 7 November 2016

of the Chalk, as well as variability in the nature of soils and shallow drift cover and soil zone processes.

3.3.1.9 In its work Atkins (2014) note that groundwater levels at Lord of the Manor are in the range -1 to +5 mAOD (36 to 30 mbgl), and about 1 m higher than during the 1980s, when the PWS was more actively used.

3.3.1.10 Across the Manston Airport site groundwater flow is from the north east to south west, with water levels falling from around 7 mAOD to 3 mAOD. Flowsource modelling undertaken for this HIA (Appendix B)) suggests that the Lord of the Manor Western Adit receives water from the area beneath the north west of Manston Airport and the large area of agricultural land to the north, whilst groundwater flowing to the Eastern Adit is derived from the eastern part of the catchment up hydraulic gradient of Ramsgate.

3.3.1.11 Under natural conditions without abstraction, groundwater flow to the south would emerge as either baseflow into the River Stour or as springs emerging from the Chalk along the coastal margin.

3.3.2 Recharge and Aquifer Properties

3.3.2.1 Recharge is predominantly via the Chalk outcrop where fracturing is developed and soils are light and permeable. Aquifer recharge is thought to occur fairly uniformly across the exposed Chalk irrespective of soil type, although there may be some time lag in recharge reaching the water table where there are soils of lower leaching potential. Recharge also occurs via the semi-permeable Thanet Formation. Over the Isle's urban areas rainfall recharge will be reduced, but there will be additional recharge inputs from leaking sewers and water mains.

3.3.2.2 Where the Thanet Formation and or Head Deposits are present, recharge may move laterally to enter the Chalk due to the present of clay layers with these deposits. In urban areas a proportion of rainfall is diverted to the surface water drainage system thus reducing recharge, although leakage from the sewer network may increase recharge again.

3.3.2.3 The Chalk is a dual porosity media with a high matrix porosity and low primary permeability. Porosity is strongly dependent on the lithology and diagenetic history. The upper parts of the sequence have around 30-50% porosity. In the saturated zone significant flow takes place within solution-enhanced fissures that constitute only a small part of the overall porosity. Such fractures are typically best developed in shallow horizons and dominantly in the zones of modern and past water-table fluctuations. The bulk of porosity lies within the matrix, but groundwater in the matrix in the saturated zone is virtually immobile.

3.3.2.4 The BGS aquifer properties database (Allen et al., 1997) lists transmissivities for the North Downs as between 52–7,400 m^2/day, with a geometric mean of 720 m^2/day. There are no data specific to the Isle of Thanet in the BGS database.

3.3.2.5 Across the airport site direct recharge will occur over greenfield areas and soft landscaping. Paved areas such as buildings, hardstand highways, runways and taxiways etc. are drained to the surface water drainage system. Some 'run-off recharge' may occur from areas covered by less permeable Head Deposits. Discussions with the EA and SWS have indicated that for the future development the same arrangements should be preserved. The EA has indicated that discharge to ground would only be considered where the ground is shown to be free from contamination, the source of water is clean (e.g. roof runoff) and the location is distant from sensitive receptors.

3.3.2.6 The site drainage is discussed in more detail in the separate FRA (Amec Foster Wheeler 2017(c))

3.3.3 Groundwater Abstractions

3.3.3.1 There are no licenced abstractions within the airport site boundary, but a number of individuals and organisations are licensed to abstract water from groundwater or ponds/lakes within 1 km of the boundary (six located within 500 m, and a further three within up to 1 km). The abstractions are for private water undertaking, public water supplies (PWS) and agriculture (Table 3.1). It is assumed that where no licence end date is provided in the data source for this table (a 2016 Envirocheck Report), then the abstraction is currently operational.

Table 3.1 Licensed abstractions within 1 km of the Manston Airport site

Licence Holder	Purpose	Source	National Grid Reference (NGR)	Operational	Direction from Development Site	Approx. Distance from Development Site Centre (m)
Wilson & Wilson Ltd	Private water undertaking: general use (medium loss)	Groundwater	631690 165470	Yes	E	176
SWS	PWS: potable water supply - direct	Groundwater	635350 165100	Yes	E	384
SWS	PWS	Pond or lake	635350 165095	Yes	E	386
Mrs L R Saunders	Spray irrigation	Pond or lake	632855 166805	Yes	W	474
Mrs E Green	General farming and domestic/spray irrigation	Groundwater	632850 166810	Yes	W	481
Mrs L R Saunders	General farming and domestic/spray irrigation	Groundwater	632850 166810	Yes	W	481
SWS	PWS: potable water supply - direct	Groundwater	630650 165140	Yes	W	805
SWS	PWS: potable water supply - direct	Groundwater	630860 164860	Yes	SW	949
SWS	Agriculture (general)	Pond or lake	630860 164855	Yes	SW	954

3.3.3.2 TDC has confirmed that it does not have any records of private water supplies within a 2 km radius of the centre of the Manston Airport site.

3.3.3.3 The Isle of Thanet Chalk aquifer has long been an important source of water for the area both for public supply and private abstraction. As mentioned in Section 2, SWS abstracts groundwater for PWS from a number of sources around the Isle of Thanet. Most sources comprise a combination of boreholes and wells and horizontal adits tunnelled into the Chalk.

3.3.3.4 Figure 3.4 shows the Southern Water abstraction locations and adits (details provided by SWS). Over time many of these sources have been abandoned, and in recent years abstraction has been from three sources in the Thanet Chalk, namely Lord of the Manor, Sparrow Castle and Minster B. The Rumfields PWS is also part of the current water supply system, but it has been out of service for several years because of a nearby contamination threat.

3.3.3.5 The Lord of the Manor abstraction is closest to Manston Airport, approximately 385m from the eastern boundary. The source comprises two wells, namely Lord of the Manor and Whitehall (the latter is disused and sealed), with three adits. The source was constructed at the southern edge of Thanet to intercept any high permeability zones and abstract groundwater which would otherwise have discharged south towards the sea. The Whitehall abstraction was constructed first, in 1850, but suffered from saline intrusion, being close to the coast. Lord of the Manor was constructed in

1933 to intercept the same adit system but positioned to overcome the saline intrusion issue (Aquaterra, 2007).

3.3.3.6 The source has a daily abstraction licence rate of 14.77 megalitres per day (Ml/d) and an annual licence rate of 4091 megalitres per annum (Ml/a). The Lord of the Manor source is part of a group licence with Minster B, Sparrow Castle and Rumsfield, with a combined abstraction limit of 7250 Ml/a.

3.3.3.7 There are three adits at the Lord of the Manor PWS (Figure 3.5 and Table 3.2), namely the Eastern, Western and South Western Adits, and which were constructed in the late 19th and early 20th century. Their details are summarised as follows:

- The Western Adit is 3103 m long and lies at an elevation of 2.8 mAOD to -0.71 mAOD (height of 3.51 m). This adit is regularly dewatered;
- The Eastern Adit is 2410 m long to the now-disused Whitehall source and then extends on for a further 1000 m to the east, with a total elevation range of 0.96 mAOD to -0.81 mAOD. It has only been partially dewatered on a few occurrences (namely 1992 and 1998). There have been stability concerns raised relating to the dewatering of the Eastern Adit, which Aquaterra (2007) speculated constrained the source output; and
- The South Western Adit is 475.5 m long. The elevation range of this adit is thought to be 0.96 mAOD to -0.8 mAOD (height of 1.76m).

Table 3.2 Lord of the Manor source construction details and pumping test information (after Aquaterra 2007)

Borehole	Depth (mbgl)	Casing Details	Diameter	Ground Level (mAOD)	Rest Water Level (mAOD)	Adits
BH1	40.9 m	Brick lined to 5.7m. Open hole to full depth	Variable in upper section up to 1.5m and approximately 1.15m in diameter below approximately 18m bgl.	35.46 (datum at 33.01 mAOD at the Chamber Floor)	0.6 mAOD (Oct 1957)	Western Adit (3103 m), ceiling 2.8 mAOD to floor 0.71 mAOD (height of 3.51m). Constructed in 1925. Eastern Adit (3410 m), ceiling 0.96 mAOD to -0.8 mAOD depth (height of 1.76m). South Western Adit 475.5 m long; ceiling 0.96 mAOD and floor -0.8 mAOD (height of 1.76m).

*Chamber floor level

3.3.3.8 The maximum deployable output (DO)[5] from the source has been considered to be 1.7 Ml/d, although Aquaterra (2007) concluded that the potential deployable output could be 4.5 Ml/d if the Eastern Adit could be dewatered. However, an adit risk assessment (on behalf of SWS) suggested that the Eastern Adit should not be dewatered due to its shallow elevation, unknown condition and potential for saline intrusion. Information from SWS indicates that although the source has not been used in recent years, actual abstraction rates before then were typically 3.5 Ml/d. Daily abstraction in the 1990's peaked at over 9 Ml/d and in the 2000's at over 8 Ml/d.

3.3.3.9 SWS, in its 2014 Water Resources Management Plan (WRMP14), stated that the maximum (peak) deployable output (PDO) of the Lord of the Manor PWS was 2.75 Ml/d and the minimum deployable output (MDO) was 1.50 Ml/d. In recent discussions with SWS[6], the water company has indicated that its current DO assessment for WRMP19 has resulted in a total write down of the DO for Lord of the Manor as a result of the nitrate water quality impacts pending a treatment solution. SWS has, however, still assessed the yield though using the full 2000 year run of the refined East

[5] The output of a commissioned source or group of sources or of bulk supply as constrained by any abstraction licence and if applicable well/aquifer properties, pumping plant and water mains, transfer and/or output mains, treatment and water quality.
[6] Dr Simon Cook – Water Resource planner

Kent groundwater model, and for a "Normal year" (1 in 2 year) it has estimated the PDO to be 5.2 Ml/d and the MDO to be 2.81 Ml/d. For a 1 in 200 year design drought event the PDO is estimated to be 2.1 Ml/d and the MDO 1 Ml/d.

3.3.3.10 In its work, Atkins (2014) indicates that the abstraction rate at the Lord of the Manor PWS was higher in the 1980s than more recently, with the source little used since 2010.

3.3.3.11 The 2013 River Stour Abstraction Licensing Strategy (ALS) (environment Agency 2013) indicates that there is "a presumption against" the licensing of new abstractions in the Chalk aquifer due to the high volume of abstraction already licensed.

3.3.4 Water Quality

Introduction

3.3.4.1 Water quality, and in particular nitrate concentrations, have been a concern in Thanet for many years, with the levels being close to, or exceeding, the prescribed concentration or value (PCV) for nitrate of 50 mg/l as nitrate or 11.3 mg/l as nitrogen (UK Drinking Water Standard (DWS), Drinking Water Inspectorate (DWI) 2012). Other water quality issues include pesticides and organic compounds, including TCE.

3.3.4.2 Water quality data from the Lord of the Manor PWS supplied by SWS for the period 2001 to 2015, together with historical investigations, have been used to understand water quality issues in this part of the Isle of Thanet.

Nitrate

3.3.4.3 Groundwater in the Thanet Chalk Block has high levels of nitrate at levels at or exceeding current DWS limits.

3.3.4.4 Data from twenty OBHs drilled into the Chalk between 1975 and 1984 were used to profile unsaturated zone nitrate concentrations (SWA, 1985), and these profiles implied a downward travel rate of nitrate through the unsaturated zone of 0.5 m/a. The profiles also suggested that the majority of nitrate was coming from fertilised land, and denitrification was not identified in the aquifer. The predictive modelling undertaken as part of the SWA study indicated that there would be a steep rise in nitrate concentrations in groundwater. For example, at the Lord of the Manor PWS the rise would commence in the early 2000s and not level off until 2100, with an increase from ~ 53mg/l NO_3 in 2000 to ~79.6 mg/l NO_3 by 2050, flattening off at ~110 mg/l NO_3 by 2100.

3.3.4.5 High nitrate concentrations have been an issue at the Lord of the Manor PWS since the 1920s, when levels already exceeded the current DWS (SWA, 1985). Data supplied by SWS show that the trend for the period 2001 to 2005 was relatively flat, with concentrations varying between around 50 to 65 mg/l NO_3. However, concentrations appear to have subsequently risen from around 57 mg/l NO_3 in 2004 to 62 mg/l NO_3 in 2010, observations that are consistent with the predictions made in the 1985 SWA study. After 2010 the PWS appears to not have been used and samples rarely taken, probably because the source can only be put into supply if nitrate treatment is undertaken.

3.3.4.6 Nitrate concentrations show no seasonal trend or correlation with groundwater levels or abstraction rate. There are, however, within the dataset samples with relatively lower or higher nitrate concentrations compared to neighbouring samples, for example:

- June 2001 (35.8 mg/l NO_3) and May 2003 (37.5 mg/l NO_3), both of which coincide with start-up of the abstraction after a period of shut-down, and a drop in water table;
- August 2003 (8.6 mg/l NO_3) and November 2005 (42.6 mg/l NO_3), both linked with relatively low water tables (<2 mAOD), low rainfall and increased abstraction; and
- August 2005 (69.5 mg/l NO_3) and October 2003 (60.6 mg/l NO_3), both linked to the water table falling and then rising.

3.3.4.7 These data suggest that when the water table is low (through a combination of low recharge and increased abstraction) the borehole and adits receive water with a lower nitrate concentration. When the source is started up after a period of no abstraction, low nitrate in groundwater is again reported. However, high nitrate can occur in response to a rising water table, and this may be explained by a pulse of nitrate that has diffused out of the matrix to the fissures. The nitrate porewater profiles described in Mouchel (2008) show that nitrate concentrations decrease with depth through the unsaturated zone.

3.3.4.8 Whilst other sources of nitrate have been considered, such as the historical use of urea-based de-icer at Manston Airport, the high nitrate has most probably arisen as a consequence of the marked increase in agricultural activity that occurred in the 1920s with the conversion of grassland to arable. Since the 1940s the area of land in arable production has generally increased in Kent, at the expense of grassland (Atkins, 2015). Ploughing up of orchards and conversion of land to market gardening created a nitrate peak in the unsaturated zone that was identified in the 1970s. High concentrations of brassica crops (cauliflowers in particular) and other intensive farming on the southern edge of Thanet also contribute to the high nitrate loading. Past activities at the Airport are not considered to be a source of nitrate.

Organic Contamination

3.3.4.9 Chlorinated solvents can include a wide range of organic chemicals containing at least one chloride ion. They have been used as degreasing and cleaning agents in military, industrial, and dry-cleaning applications for many decades, although much contamination is believed to be historical, resulting from previous careless handling and disposal procedures at a range of locations in the Lord of the Manor catchment. Carbon tetrachloride, historically used as a refrigerant, propellant, in foams and dry cleaning has been banned from use in consumer goods since 2002 due its impact on the ozone layer (EU regulation 2037/2000). Carbon tetrachloride use declined steeply since the 1980s due to concerns regarding its harmful effects.

3.3.4.10 Chlorinated solvents are volatile liquids. In liquid form they tend to sink through aquifers because they are denser than water, and are classed as dense non-aqueous phase liquid (DNAPL). They will continue to sink until they encounter low permeability strata or are exhausted by smearing and entrapment. DNAPL accumulations can form long-term sources of groundwater contamination. Much like nitrate, they can be persistent under typical oxidizing (aerobic) aquifer conditions. Some degradation does occur under favourable (reducing) environmental conditions. For example degradation of carbon tetrachloride to trihalomethanes, and tetrachloroethene (PCE) to TCE, and dichloroethenes, Vinyl chloride can occur in groundwater as a result of reductive dechlorination. The final stage of degradation is the conversion of vinyl chloride to ethenes which generally requires oxidizing conditions. Chlorinated solvents are sparingly soluble, but their solubility far exceeds DWSs (the combined DWS for PCE and TCE is 10 µg/l, and vinyl chloride has a limit of 5 µg/l). They are also poorly retarded and so are relatively mobile. Due to their persistence, chlorinated solvent plumes can be very large (several kilometres long).

3.3.4.11 Past airport activities such as aircraft repair and maintenance may have used solvents and onsite fuel storage and so could have been a source of organic contamination. It is reported that during WWII diesel fuel was burnt in trenches alongside the runway in order to disperse fog. Any residue from this activity is likely to have dispersed in the intervening 70 years.

3.3.4.12 There have been two reported (Atkins 2015) water quality incidents/issues at the Lord of the Manor PWS. These are as follows:

- June 1999 - domestic fuel spill near to the PWS adit, but remedial works ensured that the source was not impacted;
- February 2007 – low polyaromatic hydrocarbon (PAH) concentrations were found in an OBH at Cliff End possibly transformer oil or electric cable oil, linked to historical rail use.

3.3.4.13 Water quality data from Lord of the Manor for chlorinated solvents provided by SWS for the period 2001 to 2015 includes analysis for PCE, TCE, carbon tetrachloride, 1,1,1 trichloroethane (111 TCA), vinyl chloride, 1,2 dichloroethane, and total trihalomethanes (degradation products of carbon

tetrachloride). This dataset has been examined for the period 2001 to 2015 (Amec Foster Wheeler, 2017), and is plotted in Figure 3.6.

3.3.4.14 The solvent detected most frequently at concentrations above the combined DWS is PCE. The pattern of detection is discussed below, although the lower frequency of sampling in some years means that some details are likely to have been missed:

- From June 2001 to December 2002 there was a rising trend in PCE, with concentrations generally ranging between 5 and 17 µg/l, and a peak of 26 µg/l in September 2002;
- Between May 2003 and December 2006 concentrations were between 0.5 and 15.2 µg/l, although the sampling frequency was reduced;
- From 2006 to 2009 concentrations were generally between 10 to 17 µg/,l and there was no detection in samples taken in 2009; and
- Samples taken after January 2010, when the PWS was out of service, contained PCE at between 4.7 and 7.5 µg/l.

3.3.4.15 TCE was also detected, but always at concentrations below the combined DWS, with a peak concentration in June 2001 of 2.9 µg/l. Concentrations follow a similar temporal pattern to that of PCE, with the majority of elevated concentrations between 2001 and 2004, and 2007 to 2010 (Figure 3.6), decreasing to lower levels in recent years, and this suggests a common source.

3.3.4.16 Other solvents detected at the Lord of the Manor PWS include:

- TCA between December 2007 and February 2008, at concentrations of 2.8 to 4.8 µg/l;
- Vinyl chloride with a peak value of 2.4 µg/l in September 2009, but otherwise remaining at the 0.11 µg/l (the likely laboratory detection limit);
- Carbon tetrachloride was consistently detected at a low concentration throughout the dataset, with a peak value of 1 µg/l in August 2002; and
- Trihalomethanes was at a peak value of 6 µg/l in September 2001.

3.3.4.17 The changing concentrations of PCE, and potentially TCE, appear to be correlated with groundwater levels at the abstraction. In general, samples where PCE was absent coincide with periods of lower-than-usual water table (around 2 mAOD), whilst peaks in concentration typically occur when the water table is higher. This pattern may suggest that a source or plume of PCE and other solvents is present, although the decrease in concentrations in recent years suggests that the plume may have degraded over the years. Low concentrations of carbon tetrachloride, which underwent decline in use in the 1980s and was banned in 2002, suggests that the source of contamination is likely to be historical rather than ongoing.

3.3.4.18 SWS records for the Lord of the Manor PWS show only sporadic occurrence of petroleum hydrocarbons in groundwater at low concentrations below DWSs. This dataset suggests that petroleum hydrocarbons are not an existing water quality issue at the abstraction.

Pesticides

3.3.4.19 SWS samples are screened for more than 30 individual pesticide compounds with varying frequencies. The total sum of identified pesticides is also reported. The majority of analytical results are below the detection limit.

3.3.4.20 The most notable event shown in the pesticide data is a high spike in diuron concentrations at the Lord of the Manor PWS in 2000/2001. The EA investigated possible sources in the urban area, and it concluded that diuron was applied at incorrect dilution rates to amenity land, leading to the high concentrations at the PWS. Users switched from diuron to glyphosphate and concentrations of diuron at Lord of the Manor fell gradually over the following two years to reach very low levels by 2003.

3.3.4.21 Diuron has rarely been detected since, but a BGS (2004) study identified the widespread use of diuron in the Thanet area. Diuron and its metabolites may therefore be percolating through the soil and the unsaturated zone towards groundwater, and may give rise to a further impact in years to come.

3.3.4.22 Atrazine concentrations at the Lord of the Manor PWS also exceeded the PCV in 2000–2001. Since then levels have declined and have been around 20–30 µg/l. Occasional low concentrations of simazine have been detected and there was a cluster of recordings of cyanazine at all three PWSs in 2003–2005. Atrazine and simazine were banned for non-agricultural use (e.g. local authority, road and rail) in 1993, with further restrictions introduced in the 2000s.

3.3.4.23 Detection of cynazine and simazine at concentrations below the DWS in September 2004, January 2005 and September 2006 could be linked to rainfall events, flushing applied product into the aquifer. The pesticide data suggest that although the PWS is vulnerable to pollution, there are currently no issues with these substances.

Other Water Quality

3.3.4.24 Reports of saline intrusion by SWA (1985) near Margate were possibly as a result of former groundwater abstractions at a nearby PWS sources in the area (EA, 2004). Following abandonment of the source the level of saline intrusion may have reduced (Atkins, 2014).

4. Groundwater Risk Assessment

4.1 Introduction

4.1.1.1 This Chapter first summaries the key aspects of the development relevant to the groundwater environment and describes the conceptual understanding of the site. A description is then given of the approach and the results of the risk assessment undertaken using the so-called source-pathway-receptor method.

4.1.1.2 The approach adopted follows the Government guidelines for a Hydrogeological Risk Assessment report as appropriate. At this stage the information used is entirely desk-based, drawing on records provided by the EA and SWS and the results of previous investigations. No site-specific investigations have been possible because of access restrictions to the site, and therefore the assessment cannot be fully quantitative. Whilst the EA and SWS have confirmed that they would prefer any future intrusive site investigations to be limited to shallow depths with no deep boreholes in sensitive areas, this is not seen as problematic because the amount of information currently available is considered sufficient to develop a robust conceptual model and preliminary risk assessment.

4.1.1.3 Following consultation with the EA and SWS, the potential risk to the Lord of the Manor PWS in terms of water quality has been identified as the most important receptor to be considered. The potential indirect effect that may arise through the reduction in rainfall recharge due to the increase in paved area from 6% to 8% of the total catchment to the Lord of the Manor was not considered to be significant.

4.1.1.4 The key elements of the development are listed and the potential sources of contamination are discussed. Particular attention is given to the proposed new fuel farm given its proximity to the PWS. The pathway being considered is the Chalk aquifer and water entering the Western Adit of the PWS.

4.2 Proposed Development Site and Surroundings

4.2.1.1 Manston Airport has been an airport for approximately 100 years with the level of activity increasing significantly from the end of World War 2 in 1945. The airport has not been active since 2014. A full description of the proposed Manston Airport Development is provided in Chapter 3 of the ES, and the key aspects are presented below.

4.2.1.2 The Proposed Development shall consist of the following principal components:

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft
- an area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including;
  - a new Air Traffic Control (ATC) tower;
  - a fire station and fire safety training area;
  - a fuel farm; and
- facilities for other aviation-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;

- a fixed base operation for executive travel; and
- business facilities for aviation related organisations.

4.2.1.3 In light of the proposed development, those potential activities occurring in both the operational and construction phases that could have an effect on the water environment have been identified, and include the following:

- Site drainage (surface water and foil drains) and waste water treatment;
- On-site storage of fuel and chemicals;
- Runway (de-icing) and aircraft maintenance, risk of spills etc;
- Land maintenance and the application of pesticides etc;
- Fire-fighting activities; and
- Construction activities associated with
  - Disturbance/removal of contaminated ground;
  - Excavation/site investigation work creating vertical pathways for perched groundwater and contaminated land; and
  - Re-activation of old drainage network/soakaways.

4.3 Conceptual Hydrogeological Site Model

4.3.1 Introduction

4.3.1.1 As stated earlier, the conceptual model developed for the preliminary risk assessment has been based on previous work, historical reports and a desk-top study. At this stage no intrusive investigations or site-specific data such as groundwater levels or land quality data are available. The conceptual model will be reviewed and refined during subsequent risk assessment tiers.

4.3.1.2 The conceptual model represents the characteristics of the site and indicates the possible relations between **contaminants**, **pathways** and **receptors**, where:

a) a **hazard** or **potential contaminant (source)** is a activity or substance which is present in, on, or under the land and has the potential to cause harm;

b) a **receptor** is that which could be adversely affected by the contaminant, including human beings; and

c) a **pathway** is a route or means by which a receptor could be exposed to, or affected by, a contaminant.

4.3.1.3 For a potential risk to exist at a site then all three of the above elements must be present, and linked together so that a contaminant has been identified, a receptor is located on-site and there is an exposure pathway that links the contaminant to the receptor. The term **contaminant linkage** is thus used to describe a particular combination of contaminant-pathway-receptor relationship.

4.3.2 Conceptual Model

4.3.2.1 As discussed in Section 3, the geology beneath the site comprises Made Ground overlying in part Head Deposits which in turn overlies the Newhaven Chalk. The Thanet Formation may be present in the north east part of the site but is not proven.

4.3.2.2 The Chalk is classified by the EA as a Principal Aquifer and the Thanet Formation as a Secondary Aquifer A. Shallow perched water may occur in the Made Ground or above low permeability layers within the Thanet Formation, whilst the Chalk aquifer supports a number of potable abstractions, including the Lord of the Manor PWS, with its associated SPZ1.

4.3.2.3 From discussion with the EA and SWS for the purpose of this assessment, the key aspect of the conceptual model is how activities linked to the development and operation of the Airport may lead to contamination of the adit feeding the Lord of the Manor source. The main features of the groundwater and contaminant flow conceptual model are listed below:

- Direct recharge occurs mainly over the outcrop Chalk, with some 'run-off recharge' from areas covered by less permeable Head Deposits.
- The Chalk aquifer is unconfined and potential contaminants can migrate to the water table via fracture flow in fissures and relatively slow flow through the Chalk matrix, with exchange of contaminants between these two elements via diffusion.
- Groundwater contours suggest that the shape of the water table generally follows a subdued form of the surface topography, with flow radiating outward from the central topographically high area of the Thanet Chalk Block. As a result a groundwater mound has formed to the north west of Ramsgate, coincident with the Chalk anticline. Generally groundwater flow is radial towards the coast and to a lesser extent towards the Rivers Stour and Wantsum.
- Under natural conditions without abstraction groundwater flow to the south would emerge as either baseflow into the River Stour or springs emerging from the Chalk along the coastal margin.
- Groundwater under the airport site flows southward towards the natural discharge areas between Cliffsend and Pegwell, but is intersected by the Lord of the Manor PWS and its associated adits.
- Flowsource modelling (Amec Foster Wheeler 2017) suggests that the Western Adit receives water from the area beneath the north west of Manston Airport and the large area of agricultural land to the north, whilst groundwater flowing to the Eastern Adit is derived from the eastern part of the catchment up hydraulic gradient of Ramsgate.
- Groundwater levels and the source configuration and construction suggests that the input from the Western Adit is reduced at low water table. The Eastern Adit appears to consistently collect water from the eastern part of the catchment, including the suburbs of Ramsgate. Water quality data for solvents and nitrate appears to confirm this understanding of flow.
- Both solvents and nitrate behave similarly. Both are relatively conservative in aerobic aquifers and low concentrations tend to coincide with low water tables of less than 2 mAOD. During high to average water tables, higher concentrations of both are detected at the Lord of the Manor PWS.
- The sources of nitrate in groundwater include both urban (run-off, sewers and mains) and agricultural sources. Unsaturated zone porewater profiles suggest that the concentrations of nitrate beneath urban areas and parks is lower than beneath arable land. The main source of nitrate is likely to be agricultural activity.
- The source of solvents is likely to be historical, linked to light industry, with the potential for multiple sources and plumes, but interaction with these sources appears to increase at a water table at or above 2-3 mAOD.

4.3.2.4 A conceptual model cross section showing the relationship between the SWS PWS, its adits and the Chalk aquifer and the possible project effects is shown in Figure 4.1.

4.3.2.5 Given the geological setting there is little or no natural protection to the Chalk aquifer from spillages or pollution of recharge water, and with the presence of the SPZ1 the most stringent groundwater protection measures are necessary. With these measures in place, then future changes to the SPZ area or the addition of further abstractions in the vicinity of the airport site are not anticipated to require any further groundwater protection measures.

4.3.3 Potential Sources

4.3.3.1 It has been assumed that the proposed operational airport would represent similar potential sources (hazards) as the previous airport i.e. it would not lead to the introduction of any new sources of potentially polluting substances over and above those that have existed previously. However, during the development of the airport the building on new areas will result in ground disturbance and therefore the possible presence of contaminants and their release to the groundwater environment need to be considered.

4.3.3.2 The potential contaminant sources on the site are detailed in Table 4.1.

Table 4.1 Potential Contaminant Sources Associated with Manston Airport

Source Activity	Description	Potentially Polluting Substances
Water treatment facility	Plant for the treatment of on-site surface water.	Chloride, ammonium, dissolved metals, acids used for cleaning and pH balancing.
Fuel and chemical storage	Bunded fuel storage on hardstanding.	Petroleum hydrocarbons (TPH) and chemicals benzene, toluene, ethylbenzene and xylene (BTEXs).
Re-fuelling	Spillage during re-fuelling.	TPH, BTEXs.
De-icing storage and use	Storage and application of de-icing chemicals.	Glycols.
Aircraft maintenance	Spillage of organic chemicals (solvents, fuels etc.).	TPH, BTEXs, solvents.
Emergency water use/fire fighting	Fire water and disposal.	Foaming agents, hydrocarbons. May become contaminated dependent on the emergency.
Firefighting training facilities	Fire water and disposal.	Foaming agents, hydrocarbons. May become contaminated dependent on the emergency.
Pesticide application	Application of pesticides and herbicides to areas that drain into the Chalk.	Metaldehyde and herbicides (including MCPA, propyzamide, carbetamide, mecoprop and chlorotoluron) clopyralid, chlorotoluron, bentazone, metaldehyde, cypermethrin[7]
Foul drainage	Leakage from new foul sewers.	Nitrates, pesticides, organic solvents.
Surface drainage system including car parks	Leakage from drainage network	Mineral salts, nitrates, pesticides, organic solvents, bacteria
Existing soakaways	Some areas of the site drain to existing soakaways. Sediment in these soakaways may leach contamination to groundwater.	TPH, polycyclic aromatic hydrocarbons (PAHs) heavy metals.
Historical activities – soil contamination	The site has been used as a military airbase in the past and for light industrial activities linked to the operation of the site (engineering works, munitions, burning of petrol along the runway, fuel pipes, waste oil tanks, use and storage of Pyrene runway foam, burning ground area and fire-fighting activities, fuelling and cleaning of aircrafts/helicopters, use of de-icing chemicals, waste storage areas, acid pits, substations and transformers etc.) that may have produced historic contamination at the site.	TPH, BTEX, PAHs, heavy metals, chlorinated solvents, tetrachloromethane, PFOS, PFOA, glycols, emulsifiers, asbestos, cyanides, radium, PCBs.

[7] http://www.adas.uk/Portals/0/Documents/Pesticides_Forum_annual_report_2015_web_final.pdf

Made Ground/Head Deposits soils	Leaching of contaminants through disturbance and construction activities within Made Ground soils.	Ammonium, dissolved metals, phenols, asbestos and potential PAH, TPH, pH, carbon dioxide, and methane.
Made Ground/Head Deposits perched groundwater	Any perched groundwater found in the Made Ground may be potentially polluting substances and has a high vulnerability to pollution.	Ammonium, dissolved metals, phenols and potential PAH, TPH and volatile organic compounds (VOCs).
Construction activities	Ground disturbance and vibration increasing the amount of fines with the potential for increased turbidity in groundwater.	Turbidity.

4.3.3.3 In discussions with the EA, the potential hazards associated with the re-development of the existing Jentex site as the new airport fuel farm have been identified as the major concern. This aspect is therefore examined in detail in Section 4.4 below.

4.3.3.4 The EA has also identified that use of pesticides for weed control should be limited to areas with active drainage, and that no pesticides should be used over areas of land that freely drain into the underlying Chalk.

4.3.3.5 SWS has identified the possible risk of increase turbidity as a result of physical disruption (e.g. vibration, shaking) associated with any demolition, foundation piling or breaking up of the runway where it overlies the Western Adit, as a concern.

4.3.4 Potential Pathways

4.3.4.1 The main pollution pathway is from the surface to groundwater within the Chalk aquifer by vertical flow in the unsaturated zone and lateral flow in the saturated zone. The thin soils present on the Isle of Thanet do not retain pollutants and so any contaminants are readily available for leaching into the unsaturated zone and ultimately to the water table. Nitrate investigations (SWA 1985) have demonstrated that the rate of downward migration of groundwater is slow (0.5 m/a), although there are occasionally episodes of more rapid movement following storms.

4.3.4.2 The Chalk is a dual porosity aquifer, in which any contamination that enters the Chalk migrates into the matrix under a concentration gradient. The reverse, diffusion-controlled movement out of the matrix into flowing groundwater within fissures limits the rate at which contamination can be flushed from the aquifer. In addition, the matrix remains saturated above the water table, where water is held by capillary forces, and water within the matrix above the water table moves downwards slowly. In these ways the unsaturated zone and zone of water table fluctuation can act as stores of contaminant mass. The interaction between fissures and matrix acts in the short term to reduce the peak of contaminants arriving at a receptor, but can also lead to contamination having a much longer duration or retention time, even if contaminant concentrations at the source diminish and fracture water concentrations start to reduce.

4.3.4.3 The additional potential pathways that may be introduced due to the project include the following:

- **Deep foundation piling**: construction of piled foundations, other deep structures and excavations for any new buildings may create vertical pathways within the unsaturated zone.
- **Excavations**: if dewatering is required for deep excavations, pumping has the potential to draw in contaminated groundwater from elsewhere on-site or from off-site sources, creating new pathways or altering existing pathways.
- **Demolition**: demolition of old buildings may create vertical pathways within the unsaturated zone.
- **Boreholes**: incorrectly constructed and sealed deep site investigation or water level monitoring boreholes can create vertical pathways within the unsaturated zone.
- **Construction**: may cause vibration leading to increased turbidity in groundwater.

4.3.4.4 Current pathways and pathways that may be developed due to the project are identified in Table 4.2. As many of the pathways that may be created during the construction will remain during the operation phase, the pathways for both phases can be considered together.

Table 4.2 Receptors and Pathways

Receptors	Pathway
Groundwater in the Chalk aquifer (Principal Aquifer)	Discharge of contaminated groundwater through lateral flow in Made Ground into the Chalk. Discharge of contaminated groundwater through lateral flow in Head Deposits into the Chalk. Discharge of contaminated groundwater through lateral flow in Thanet Formation into the Chalk. Vertical migration of contaminants. Vertical migration via artificial pathways (e.g. deep piles, deep boreholes). Vertical migration in excavation areas from Made Ground. Lateral groundwater flow. Vibration leading to release of turbidity.
Groundwater in Thanet Formation aquifer (Secondary Aquifer A)	Discharge of contaminated groundwater through lateral flow in Made Ground into the Thanet Formation. Discharge of contaminated groundwater through lateral flow in Head Deposits into the Thanet Formation. Vertical migration of contaminants. Vertical migration via artificial pathways (e.g. foundations, deep piles). Vertical migration in excavation areas from Made Ground. Lateral groundwater flow.
Groundwater in Head Deposits	Discharge of contaminated groundwater through lateral flow in Made Ground into the Head Deposits. Vertical migration of contaminants. Vertical migration via artificial pathways (e.g. foundations, deep piles). Vertical migration in excavation areas from Made Ground. Lateral groundwater flow.
Lord of the Manor PWS Chalk aquifer	Vertical migration of contaminants. Vertical migration via artificial pathways (e.g. deep piles, deep boreholes). Lateral groundwater flow into adit.
Coastal waters	Vertical migration of contaminants. Vertical migration via artificial pathways (e.g. deep piles, deep boreholes). Lateral groundwater flow to coastal discharge locations.

4.3.5 Potential Receptors

4.3.5.1 The main receptors that are potentially at risk from the proposed project are summarised below:

- Groundwater in the Chalk aquifer (Principal Aquifer); and
- Groundwater PWS (the Lord of the Manor source).

4.3.5.2 Possible perched groundwater in the Head Deposits or Thanet Formation (Secondary Aquifer A), if present, is not considered to be significant due to its limited occurrence and because any groundwater from these formations is likely to drain into the underlying Chalk.

4.3.5.3 The likely significant effects from ground conditions on designated ecological receptors (i.e. Pegwell Bay SSSI) have been 'screened out' of requiring further assessment in this HIA. This is on the basis that the identified ecological receptor is located downstream of the Lord of the Manor PWS and its associated adit, therefore any additional mitigation measures identified as outcomes of the assessment of impacts on groundwater underlying Manston Airport will also be protective of the migration pathways through groundwater towards the Pegwell Bay SSSI.

4.4 Hydrogeological Impact Assessment

4.4.1 Introduction

4.4.1.1 A risk assessment following the EA GP3 has been undertaken using the Manston Airport conceptualisation presented in Section 4.3. The site activities are identified as an operational airport and associated construction work and the main receptor considered is the Chalk aquifer and in particular the Lord of the Manor PWS/Western Adit.

4.4.1.2 As the Manston Airport location cannot be changed and is a NSIP, then in accordance with EA requirements, the emphasis is placed on the protection of groundwater. The EIA process and this accompanying HIA identifies all the potential pollution linkages and the best available techniques to mitigate the risks. The EA has been involved in discussions of the development, and has helped to identify suitable mitigation measures.

4.4.1.3 As identified in Section 2, the presence of the SPZ around the Lord of the Manor PWS influences the assessment as follows:

- SPZ1: Potentially polluting activities are not permitted in a SPZ1. The SPZ1 extends along the line of the Western Adit to the Lord of the Manor PWS, and is more or less coincident with the runway (see Figure 2.2). There are no new potentially polluting activities in this area associated with construction and operation of the proposed development. For example, drainage from the runway would be collected and diverted off-site, so that the potential for pollution from activities on the runway is minimised.
- SPZ2: the EA will only agree to proposals for infrastructure developments where they do not have the potential to cause pollution or harmful disturbance to groundwater flow or where these risks can be reduced to an acceptable level. In order to reduce risks then the EA expects best available technology (BAT) to be applied. Activities within SPZ2 have been assessed on this basis.

4.4.1.4 The HIA presented here therefore considers those potential activities with SPZ2, on the assumption that there would be no new potentially polluting activities within the currently defined SPZ1. It comprises the following elements:

- Identification of main hazards (sources);
- Assessment of the likelihood of a release occurring;
- Assessment of the consequence of a release to receptors;
- Assignment of a relative measure to each of the above parameters to enable a qualitative assessment of the overall risk level (low, medium, high, critical);
- Identification of mitigation measures that would be put in place to stop or reduce the risk of contaminants escaping into the environment; and
- Recommendations for additional measures or monitoring where a residual risk has been identified.

4.4.1.5 For each source, the risk assessment therefore considers the hazard (e.g. event causing a release of a contaminated substance to the environment), the consequence of the release (e.g. pollution at a receptor), the likelihood of the event, and the mitigation measures that can be implemented to prevent or reduce the consequence of the event. The assessment considers the risk before and after safeguards are put in place. Where the overall risk is identified as high or above, then the proposed Project is considered to represent an unacceptable risk unless further mitigation measures can be implemented.

4.4.2 Hazards

4.4.2.1 For each of the identified sources, the impact assessment identifies the possible mechanisms that could result in the release of contaminants to the environment by considering such aspects as location, failures and maintenance and operational activities. Contamination due to surface water flooding and flood water management has been considered in the FRA and therefore are not be considered here.

4.4.2.2 The main mechanisms that could result in a release to the environment for the sources considered for this development (see Table 4.1 above) are as follows:

- Leaks from fuel and chemical (de-icing compounds/fire-fighting foam additives) storage tanks and delivery tankers during off-loading;
- Failure or overtopping of bunds or concrete floors/hardstanding during refuelling etc;
- Spillage from fire-fighting training ground;
- Failure of liners of attenuation bunds;
- Leakage from drainage network;
- Leakage of effluent from foul main network;
- Contamination following an emergency incident; and
- Application of pesticides to free draining areas.

4.4.2.3 Additional mechanisms that could result in an increased risk to the environment during the construction phase of the project are as follows:

- Possible vertical and lateral pathways would be generated between aquifers during site investigation work;
- Creation of vertical groundwater pathways between aquifers through piled foundations, other deep structures and excavations;
- Mobilisation of poor quality groundwater within the Made Ground or Head Deposits;
- Earth and groundworks during demolition and construction mobilising contaminants into the Chalk aquifer; and
- Ground disturbance and vibration increasing the amount of fines with the potential for increased turbidity in groundwater, particularly works in the vicinity of the adit under the runway.

4.4.2.4 In discussions with the EA, the potential hazards associated with the re-development of the existing Jentex site as the new airport fuel farm have been identified as the major concern. This aspect has therefore been examined in particular detail below, before construction and other operation hazards are considered.

Fuel Farm Hazards

4.4.2.5 As part of these proposals, there is a requirement for a new fuel storage facility to accommodate the needs of the airport. The existing Jentex fuel storage facility, located to the south east of the airport (Figure 4.2), has been identified as the preferred option (Amec Foster Wheeler 2017(d)) for the new fuel farm as part of the redevelopment of the airport. The Jentex site has been in operation for approximately 50 years. It is anticipated that the Jentex site would require re-development to meet current standards, along with a review of the new design for compliance against current regulations.

4.4.2.6 Following a review of the current layout and design, the fuel farm layout presented in Figure 4.3 has been proposed for the new development, although any final layout will be subject to a further detailed design.

4.4.2.7 The main features and design changes compared to current layout include the following:

- New Jet A1 fuel storage tanks. To meet the daily fuel throughput requirements, it would be necessary to simultaneously load and offload from the Jet A1 Fuel tanks. For these activities to take place, the design requires separate loading and offloading storage tanks as well as an intermediary settling tank. Therefore, the current design includes 3 x 700m^3 (1 x loading, 1 x settling and 1 x offloading) double skinned Jet A1 fuel tanks located within a common bund;
- Fuel would be delivered to the site by road tanker. Fuel delivery to aircraft would be by a fleet of specialist fuel bowsers.
- It is anticipated that a small number of light aircraft may use Manston Airport. Therefore, an additional 20 m^3 Avgas storage tank has been provided. This is located to the east of the main Jet A1 tanks, within the same common bund. The demand for Avgas is expected to be low, therefore the number of loading and offloading activities required for Avgas would be significantly less compared to the Jet A1;
- A dedicated bowser and trailer parking area has been provided to the east of the site. Normally empty bowsers would be parked within this area, but there is the potential for Jet A1 bowsers to be filled and stored in the parking area overnight ready for the morning shift, although this would be a maximum of two or three bowsers with connected trailers; and
- Fuel tanker offloading and bowser loading would occur to the south and north of the site respectively. Each of these locations would be provided with a curbed / bunded area and a sealed drainage system to contain unexpected leaks and prevent offsite releases and discharges into public waterways.

4.4.2.8 There are many potential hazards to be taken into consideration in the design of the new fuel farm and future operation. In this section, consideration is being given to the risks of a significant leak of aviation fuel reaching the saturated part of the underlying Chalk aquifer. The main pathway is from the surface to the Chalk groundwater, by vertical flow through fissures in the unsaturated zone and then lateral flow in the saturated zone.

4.4.2.9 It is expected that any kerosene spilt at the surface and bypassing any containment and drainage capture system, would enter the ground and travel downwards via fissures. A proportion of the release volume would be left along the pathway, smeared and entrapped. For small spills, the effect of smearing and entrapment would attenuate the kerosene before it reaches the water table, which lies at ~35 mbgl.

4.4.2.10 For larger spills, kerosene would reach the water table, where it would spread out to form a light non-aqueous phase liquid (LNAPL) within the fissured Chalk. The kerosene would move out under the driving head created by the accumulation of LNAPL beneath the spill until either the driving head is no longer large enough to drive further movement, the LNAPL reaches the edge of the aquifer / receptor, or it reaches a barrier to flow.

4.4.2.11 The direction of spread is driven by the thickness of LNAPL, the hydraulic gradient of the water table and the orientation of fissures. Where there is limited hydraulic gradient, spreading would be close to radial. At Manston, the PWS adits are a potential preferential pathway for migration of LNAPL and contaminated groundwater, and may influence the location and rate of spreading.

4.4.2.12 Larger spills have the potential to create their own driving head beneath the site of the spill due to the accumulation of LNAPL in fissures. This can force LNAPL below the water table as well as laterally. Furthermore, kerosene in contact with groundwater would leach hydrocarbons into groundwater to create a dissolved phase. This dissolved phase would be dominated by the more soluble compounds such as benzene, even though these form only a small proportion of the total mass. Due to the low mass of soluble compounds in kerosene, the concentrations of these

compounds in groundwater would reduce over time as they are leached out and exhausted. As a result of leaching of the more soluble compounds, the remaining LNAPL would eventually comprise largely insoluble compounds. If left in the ground, this insoluble LNAPL would likely persist for many years.

4.4.2.13 As a result of leaching, a plume of contaminated water would develop extending from beneath the LNAPL downgradient in the direction of flow. Initially, the plume would expand in the downgradient direction as contaminants are leached from the LNAPL. However, following a period of acclimatisation, microbial-mediated degradation would start to degrade the dissolved compounds. The rate of degradation could be fast when compared to the rate of movement. Typically the degradation process would result in the plume stabilising at some distance, before starting to contract once the supply of hydrocarbons available from leaching is reduced or exhausted.

4.4.2.14 Under natural conditions (i.e. the Lord of the Manor PWS not pumping), the hydraulic gradient is to the south with discharges around Pegwell Bay. With the Lord of the Manor PWS pumping then it is possible that the gradient is reversed with flow northwards towards the adit. If such a gradient exists and given the small distance to the adit, rapid contamination of the PWS could be possible.

4.4.2.15 Alternatively, as the adit is located to capture a large proportion of groundwater flow from the north of the Thanet Block, it is possible that the majority of the flow into the adit comes from the north and very little from the south. If this is the case then even under pumping conditions the groundwater gradient northward towards the adit may be small or even absent.

4.4.2.16 To help resolve this uncertainty, a numerical analysis has been undertaken to determine the relative significance of flow to the Lord of the Manor adit from the aquifer to the south of the source, relative to flow from the aquifer to the north of the source. This was achieved using results from the EA's existing East Kent regional groundwater model (currently the BAT) and also the Flowsource software to predict the relative volumes of flow entering an adit to the source from the north and from the south. A technical note describing the methodology and results is presented in Appendix B.

4.4.2.17 The East Kent regional groundwater model was constructed by Mott MacDonald for the EA and other stakeholders in 2006. The model covers an area between the Chalk scarp east of Ashford to the coast around the Isle of Thanet. The model has three layers (two for the Chalk and one for overlying strata) and is built on the MODFLOW-VKD code, and uses the EA's in-house recharge code. The Lord of the Manor PWS is represented in the model as 30 abstraction wells, including the borehole and the Eastern, Western and South Western Adits. Each abstraction well pumps at the same rate.

4.4.2.18 The HIA has been based on outputs from two East Kent model runs. In the Recent Actual (RA) model each well pumps at 116.7 m^3/d, representing the average rate at which the PWS was pumped in recent years (3500 m^3/d i.e. 3.5 Ml/d). In the PDO model each well pumps at 173.3 m^3/d, equivalent to a total abstraction for the PWS of 5.2 Ml/d. The Flowsource software has then analysed the modelled groundwater heads and flows to quantify the contributions of water from different parts of the Chalk aquifer to the Lord of the Manor PWS.

4.4.2.19 Flowsource takes the groundwater heads and flows from the MODFLOW model in each model cell, during each modelled stress period, and calculates the following outputs:

- Capture Fraction (CF) - The fraction of water within each model cell captured by (or ending up at) a specified model cell (e.g. the cell hosting an abstraction).
- Volume From (VF) - The volume of water input to each model cell by model boundary conditions (i.e. recharge, riverbed leakage, and release from aquifer storage) that is captured by or ends up at a specified model cell.
- Volume Through (VT) - The volume of water that flows through the faces of each model cell that is captured by or ends up at a specified cell, based on the capture fraction and the total volume of water flowing through the faces of the model cell.
- Age of waters - The time of travel from individual model cells to the abstraction cell. This calculation is based on the calculation of the time of travel of particles released at the water

table, from the centre of each model cell, to the abstraction cell (using the MODPATH method of calculation of flow through permeable saturated media). This value does not include time of travel through the unsaturated zone.

4.4.2.20 The results of the combined model analysis are summarised as follows:

- A small proportion of the flow to the Western Adit of the PWS is predicted to originate from the aquifer to the south of the adit. In the long term average, the proportion of flow originating from the south is about 1.2% (RA model) to 4.2% (PDO model).
- Under high water levels, this proportion is further reduced to about 0.1% to 0.2%. Under low water levels, the proportion is about 1.5% (RA model) to 5.3% (PDO model).
- This contribution, whilst very small, is not zero.
- In the RA model the flow that does reach the adit from the south is predicted to have very long times of travel in the saturated zone. This is due to a predicted zone of stagnation being to the south of the adit and close to it.
- In the PDO model there is a small area to the south of the adit with a predicted time of travel of about 200 days, i.e. the predicted zone of stagnation is slightly further to the south, as would be expected.
- In the RA model the proposed fuel farm location lies on the very edge of the modelled PWS catchment. The model cells immediately to the south of the proposed location are predicted to lie outside the catchment.
- In the PDO model the PWS catchment extends one additional model cell (i.e. 250 m) to the south and thus includes the proposed fuel farm location.
- In both models there is a very small predicted component of saturated groundwater flow east-west near the adit. However, the dominant direction of flow is north-south.

4.4.2.21 In conclusion, the location of the fuel farm site south of the adit means that when the Lord of the Manor PWS is pumping only a small proportion of groundwater form under the site flows north to the PWS adit. This indicates that a pollution event may not lead to an immediate and large scale contamination of the PWS. However, although a small fraction of the flow to the adit is predicted to originate from the aquifer to the south, it is not zero. Therefore the risk of contamination of the PWS cannot be eliminated without mitigation. In the case of a large fuel spill this can create its own driving head that could drive fuel in different directions or more rapidly towards the adit.

4.4.2.22 There are a number of uncertainties in the modelled results, including the following:

- The model is based on a 250 m grid, and as such all output represents average values over a 250 m square.
- Where there are sharp gradients in Flowsource outputs, such as close to the catchment boundary to the south, there will be significant uncertainty in the values at a precise location.
- The Flowsource flow values are the result of interpolation from the rotated model grid. Whilst this is a robust procedure, it introduces further uncertainty into the results.
- Small scale hydrogeological features, such as the precise location of the zone of stagnation and the detail of the ‘cone of depression’ around the PWS, are unlikely to be precisely represented by the model.

Construction Hazards

4.4.2.23 Hazards that could result in an increased risk to the environment during the construction phase of the project include the following:

- Drilling causing vertical and lateral pathways to form between aquifers during site investigation work;
- Creation of vertical groundwater pathways due to piled foundations, other deep structures and excavations;
- Mobilisation of perched poor quality groundwater within the Made Ground or Head Deposits;

- Earth and groundworks during demolition and construction mobilising contaminants into the Chalk aquifer; and
- Ground disturbance and vibration increasing the amount of fines with the potential for increased turbidity in groundwater, particularly associated with works in the vicinity of the adit under the runway.

4.4.2.24 As with the other hazards discussed above any contamination entering the Chalk aquifer will migrate to the Western Adit. The relatively large unsaturated zone thickness (>30 m) and the relatively slow rate of water flow through this zone (0.5 m/a) beneath these parts of the airport means that any spill or accidental release of pollutants may not result in immediate or large scale contamination of the PWS.

4.4.2.25 The creation of vertical pathways through site investigation drilling and/or deep foundations could result in more rapid contamination of the PWS, and therefore such work should be avoided or if absolutely necessary undertaken with extreme care.

Other Operational Hazards

4.4.2.26 Operational hazards other than fuel farm leakage include the following:

- Leak from chemical (de-icing compounds/fire-fighting foam additives) storage tanks;
- Failure or overtopping of bunds or concrete floors/hardstanding during aircraft refuelling etc.;
- Spillage from fire-fighting training ground;
- Failure of liners of attenuation bunds;
- Leakage from drainage network;
- Leakage of effluent from foul main network;
- Contamination following an emergency incident; and
- Application of pesticides to free draining areas.

4.4.2.27 In all these instances contamination entering the Chalk aquifer will migrate to the Western Adit. The relatively thick unsaturated zone beneath these parts of the airport and the slow rate of flow through this zone again means that any associated spill or accidental release of pollutants may not result in immediate or large scale contamination of the PWS.

4.4.3 Mitigation Measures

4.4.3.1 An important mitigation measure is that no potentially polluting activities would be located in SPZ1.

4.4.3.2 With respect to any potentially polluting activities located in SPZ2, standard mitigation measures in line with good practice and guidance would be implemented where appropriate, including measures to manage flood risk and drainage which are set out in the accompanying FRA. The EA in its response to the PEIR consultation (18th July 2017) indicated that it "*would therefore seek to work with applicants to ensure maximum environmental controls are in place for any agreed return to airport use*".

4.4.3.3 The main mitigation measures that have been included in the development are listed below, but these will be reviewed and revised once the final scheme is agreed and the results of any site investigation data are available.

Fuel Farm Construction and Operational Mitigation

4.4.3.4 For the fuel farm it would be important that specific and robust measures are incorporated into the design that address layout, primary containment integrity, and design/operational controls for rapid detection, effective isolation and secondary/tertiary containment. The EA has stated that they "*would need to see a full options appraisal for any fuel depot location and agree full designs and*

containment processes for any agreed location". The various options have been assessed (Amec Foster Wheeler 2017(d)). The appraisal identified that the adaptation of the Jentex site as the site for the Manston Airport fuel farm performs best against all of the following fuel farm requirements:

- existing fuel farm infrastructure;
- sufficient space and capacity;
- separate and/or segregated access;
- road access;
- landside/airside access;
- outside of groundwater SPZ1;
- costs and constructability; and
- proximity to aircraft aprons/stands and other operational considerations.

4.4.3.5 The following aspects can be considered within the fuel farm design following BAT principles, but these would be reviewed and revised once the final scheme is agreed.

- Primary containment is around the design of the fuel tanks and associated pipework (materials, thickness);
- Secondary containment takes a number of forms. In this case is includes a double skin on a tank;
- Bunding also provides a further level of secondary containment, affording containment to pipework and equipment associated with the tank, but outside of the double skin. The appropriate sizing of bunding around the tanks. Guidelines require that the bunding must have the capacity to contain the largest predictable spill. This is achieved by providing the largest of either 110% capacity of the largest tank within the bund or 25% of the total capacity of tanks within the bund. For this tank farm a high level of integrity is embedded in the design, and each tank is located in an individual bund, so that only one tank is contained within one bund with 110% of the capacity of the tank plus an allowance for 1:100 rainfall event. Bunds to be constructed with adequate protection against collision and designed in accordance with standards;
- Comprehensive areas of hardstanding across the site with an associated active drainage capture system to collect all surface drainage and hence and any leaks;
- Containment with sealed drainage systems would be applied to bunds and fuel points, preventing the accidental entry of contaminants into sewer/stormwater drainage network;
- Oil interceptors and anti-pollution control valves would be installed to surface water runoff from internal roads;
- Systems of leak detection would be established beneath the tanks;
- The tank, pipework and loading/unloading would be equipped with shutdown to provide effective isolation. Where required this would include automatic detection and isolation systems (eg to protect against overfill of tank) and
- Appropriate areas of hardstanding, parking and operational buildings would be constructed for the airside bowser fleet

4.4.3.6 In addition to leaks from the fuel tanks, contamination may also occur through spillage during loading and offloading operations. The inclusion of hard standing (with high kerbs) and an active drainage capture system would contain any spills and prevent them finding a route to ground (and ion the groundwater) or a pathway to the Pegwell Bay Outfall.

Other Construction Mitigation

4.4.3.7 Any potential sources introduced during re-development construction will be controlled through good practice as set out in a Construction Environmental Management Plan (CEMP) and associated Code of Construction Practice (CoCP), and as such are unlikely to present a significant risk to groundwater. It would be a requirement that companies undertaking any redevelopment work and all their workers and sub-contractors are made fully aware of the hydrogeological setting and the sensitivity of the Lord of the Manor PWS and the appropriate measures required to minimise the risk of impact. During the development and construction phase mitigation measures may include the following:

- Contaminants would be prevented from entering the surface water system, including but not limited to sediment, fuel oil and building aggregates;
- Hazardous liquids would be stored further than 10 m from any surface waters or surface water gullies during the construction phase;
- If there are concerns over potential impacts on the environment, works would be halted and the EA consulted immediately;
- The EA would be consulted on any changes made to the design of the surface water system;
- The EA would be consulted to ensure that the water quality discharge licence is varied in accordance with the current design proposals;
- Avoidance of the completion of deep boreholes, particularly in the more sensitive parts of the site, with all site investigation boreholes restricted to the minimum depth required to obtain geotechnical data for design purposes;
- No groundwater level OBHs would be constructed, unless approved by the EA;
- Dewatering or the placement of flow barriers to manage perched groundwater in the Made Ground during groundworks, so that flow into the underlying Chalk is prevented;
- The presence of potential groundwater flow in the Head Deposits would be taken into account in the design of deeper structures and in the selection of any infill materials;
- All contaminated ground would be investigated and remediation (as required) completed prior to the site being redeveloped;
- Physical work within close proximity of the Western Adit may be potentially restricted (in type, timing and duration), subject to a further assessment;
- Piling would be avoided in sensitive areas, but if required would be designed to minimise hydrogeological risk[8] by using piling techniques that minimise disturbance and that also provide good seals;
- If/when existing buildings and infrastructure are demolished, then appropriate site assessment would be needed under footprints to ensure any historic contamination risk is fully understood and addressed. This is especially relevant for any chemical or fuel storage areas, including the Jentex site. Temporary surface water management or cover systems may be needed of exposed footprints until any remediation has been completed; and
- The location and configuration of any cement- or asphalt-batching plant during construction activities would be agreed with the EA, and such plant should be as far from the SPZ1 area as possible, and designed to ensure all drainage is positively controlled.

4.4.3.8 In its response to the 2017 PEIR consultation, the EA also recommended the following:

- Personnel should be trained on the use of spill kits where applicable, and other mitigation measures as outlined in the spill response plan;

[8] *Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: guidance on Pollution Prevention* (National Groundwater and Contaminated Land Centre report NC/99/73) and *Piling into contaminated sites* (Environment Agency publication).

- Penstock valves (existing or new) should be considered during the design phase of the surface water system, and relevant personnel trained in the use of the emergency system;
- A review of the use of any pesticides on the grassed areas should be undertaken to prevent pollution to groundwater or run-off in to surface water drains; and
- Outfalls in to surface waters should be monitored regularly during the construction phase, and works halted if pollution is observed.

4.4.3.9 All these mitigation measures would be incorporated in the development.

Other Operational Mitigation

4.4.3.10 The prevention of leakage and spillage of hazardous materials stored or used on-site would be addressed through environmental permitting during the operational phase. Mitigation measures would be documented in a future Environmental Management Plan (EMP) for Manston Airport. Specific measures would include the following:

- All drainage would be actively collected in appropriately sized attenuation pond(s) and treated prior to discharge off-site. Facilities would allow the interception and segregation of contaminated water and cleaner water (e.g. roof run-off). Ponds would be monitored for possible leakage;
- EA Position Statement (Environment Agency 2017) G12 states "*The discharge of clean roof water to ground is acceptable both within and outside SPZ1, provided that all roof water down-pipes are sealed against pollutants entering the system from surface run-off, effluent disposal or other forms of discharge. The method of discharge must not create new pathways for pollutants to groundwater or mobilise contaminants already in the ground. No permit is required, if the above criteria can be met*" However, discharge of treated water and clean water would be to Pegwell Bay rather than to ground, accompanied by the appropriate monitoring of water quality. Any discharge to ground would only be considered in those locations where the ground is shown to be free from contamination, the source of water is clean (e.g. roof runoff) and the location is distant from sensitive receptors;
- The location of all foul drainage would be agreed with the EA, and any decommissioned existing drains would be removed to ensure they do not form pathways for contaminant transport into the ground;
- All retained drainage pipework would be surveyed to allow the identification of leaks/failures, and would be repaired to meet modern standards;
- All existing soakaways would be decommissioned and infilled with clean aggregate;
- All storage tanks would be appropriately designed to current standards (e.g. double skinned, bunded etc.), and the design of required tank bunds would provide 110 per cent storage capacity based on largest tank capacity and with the allowance for a 1:100 rainfall event;
- Deliveries of any chemicals would be to designated bunded areas, with control levels and alarms used to identify leaks or overflows;
- The fire-fighting training ground would be appropriately sized, using a lined (impermeable base) hardstanding and with a perimeter bund;
- Proposals for storage and use of any materials for firefighting would need the agreement of the EA, and particular materials may not be approved, of some types of firefighting foams for instance, if there is a risk of loss to ground;
- Aircraft maintenance areas would be would be appropriately sized, using a lined (impermeable base) hardstanding and with a perimeter bund and contained drainage network;
- Monitoring of the airport facilities and potentially contaminating activities would be undertaken utilising inspections and regular walkover surveys;

- Maintenance and inspection procedures would be documented and implemented; and
- Environmental monitoring of surface waters would be put in place.

4.4.4 Risk Matrix

4.4.4.1 The risk matrix combines the likelihood of a hazard event occurring with the consequence of the event to derive an overall risk (negligible, low, medium, high and severe). The likelihood and consequence categories are summarised in Tables 4.3 and 4.4 respectively, and are based on Amec Foster Wheeler's catchment risk assessment experience in the water industry.

4.4.4.2 The combined risk matrix is set out in Table 4.5, and individual hazards are then assessed with respect to the key Lord of the Manor PWS receptor using this risk matrix. The combination of likelihood and consequences leads to a qualitative assessment of the overall risk that is categorised from negligible to severe.

Table 4.3 Likelihood Assessment Criteria

	Likelihood					
	1	**2**	**3**	**4**	**5**	**6**
	Remote	**Highly Unlikely**	**Unlikely**	**Possible**	**Likely**	**Highly Likely**
Historical	Unheard of in the water industry	Has occurred one or twice in the water industry	Has occurred many times in the industry	Has been experienced once or twice by a water company	Has occurred frequently in a water company's experience	Has occurred frequently at a particular location
Frequency: (Continuous Operation)	Once every 10,000 - 100,000 years at location	Once every 1,000 - 10,000 years at location	Once every 100 - 1,000 years at location	Once every 10 - 100 years at location	Once every 1 - 10 years at location	More than once a year at location or continuously
Probability: (Single Activity)	1 in 100,000 - 1,000,000	1 in 10,000 - 100,000	1 in 1,000 - 10,000	1 in 100 - 1,000	1 in 10 - 100	> 1 in 10

Table 4.4 Consequence Assessment Criteria

Category	Description
Catastrophic	Large scale impact on Chalk aquifer. Results in exceedance of DWSs in PWS and other abstractions with the need to shut down supply or implement additional treatment. Long term/permanent impact.
Massive	Large scale impact on the Chalk aquifer. Results in exceedance of DWSs in PWS abstraction with the need to shut down supply or implement additional treatment. Long term (many years) impact.
Major	Large scale impact on the PWS source with major exceedance of water quality standards, and exceedance of DWSs and implement additional treatment. Long term (months/years) impact.
Moderate	Moderate scale impact on Chalk Aquifer with some deterioration in water quality standards and drinking water standards. Potable abstractions need monitoring and may need to be taken out of supply. Medium term impact (weeks/months).
Minor	Minor scale impact on Chalk aquifer with minor deterioration in water quality standards with low risk to groundwater abstractions. Medium term (weeks/months) impact.
Slight	Limited with little or no deterioration in water quality standards. Short term (days/weeks) impact.

Table 4.5 Risk Matrix

Consequence	Likelihood					
	Remote	Highly Unlikely	Unlikely	Possible	Likely	Highly Likely
Catastrophic	Low	Medium	High	High	Severe	Severe
Massive	Low	Medium	Medium	High	High	Severe
Major	Negligible	Low	Medium	Medium	High	High
Moderate	Negligible	Low	Low	Medium	Medium	High
Minor	Negligible	Negligible	Negligible	Low	Medium	Medium
Light	Negligible	Negligible	Negligible	Negligible	Low	Medium

4.4.5 Assessment Results

4.4.5.1 The combined risk table set out in Table 4.5 has been used to assess the individual hazards (as identified in Table 4.1). Details are given in Table 4.6 for those activities associated with the construction. Table 4.7 assesses hazards associated with the long term operation of the airport.

4.4.5.2 The assessment identifies that, without mitigation measures, a number of hazard events could result in a medium risk to the Lord of the Manor PWS during construction. Although residual (with mitigation) effects are considered for the temporary works during the construction phase to be negligible or low, a CoCP would be produced to manage activities during construction.

4.4.5.3 The assessment identifies that, without mitigation measures, a number of hazard events could result in a medium to high risk to the Lord of the Manor PWS during operations. However, the residual risk following the implementation of mitigation measures is generally negligible or low.

4.4.5.4 In the case of the fuel farm the implementation of the proposed mitigation measures results in a low residual risk.' It is expected that an EMP would be produced for the operational phase, and pollution prevention plans would also need to be agreed, and would consider best practice and also available innovative measures for spillage management.

4.4.5.5 The EA guidelines indicate that the EA will agree to fuel storage over Principal and Secondary aquifers outside an SPZ1, provided there is evidence of overriding reasons why the:

- activity cannot take place within unproductive strata; and
- storage must be underground (for example, for the purpose of public safety), in which case it is expected that the risks are appropriately mitigated. For Manston Airport the EA has indicated a preference for any such storage to be above ground.

4.4.5.6 Where such storage already exists (as in the case of the potential use of the Jentex site), the EA "*will work with operators to assess and if necessary mitigate the risks, including an aim to change to above ground storage*".

4.4.5.7 For all storage of pollutants underground (hazardous substances and non-hazardous pollutants), the EA expects operators to adopt appropriate engineering standards and have effective management systems in place. These should take into account the nature and volume of the materials stored and the sensitivity of groundwater, including the location with respect to SPZs.

4.4.5.8 These aspects would be taken in to consideration in the design of any new facilities, and so the risk from leakage from fuel tanks could further be reduced by:

- regular inspection of tanks and operating facilities and tank integrity monitoring programme would be required;
- regular inspection of bunds and impermeable surfaces;
- implementation of strict fuel delivery and control systems; and

- detailed emergency response procedure/plan in the event of a failure.

4.4.5.9 The EMP and FRA would aim to ensure that the EA's objective of "*Good Status by 2027*" for the Kent Isle of Thanet Chalk WFD groundwater body is not compromised.

4.4.5.10 Consideration of the hydrogeological risks as part the project layout design allows designers to incorporate mitigation measures to minimise the groundwater risks from the Manton Airport development.

Table 4.6 Determination of Hydrogeological Risks - Construction

Potential Source/Hazard	Mechanism	Likelihood	Consequence	Risk	Mitigation	Revised Likelihood	Residual Risk
Historical activities – soil contamination	The site has been used as a military airbase in the past century and light industrial activities linked to the operation of the site. Past activities may have produced historic ground contamination at the site. Possible vertical and lateral pathways may exist to the underlying aquifer that could be activated by construction work and/or site investigations.	Possible	Moderate	Medium	Water table deep (>30m below ground level), and earthworks are expected to be in dry material. No new deep boreholes would be constructed. Ground investigations and remediation (as required) would be completed prior to the site being redeveloped/constructed. If saturated material encountered then this would be contained and if contaminated remediated as appropriate.	Highly unlikely	Low
Made Ground and Head Deposits – deposit contamination	Past activities may have produced historic ground contamination at the site. Possible vertical and lateral pathways may exist to the underlying aquifer that could be activated by construction work and/or site investigations. Creation of vertical groundwater pathways between aquifers through piled foundations, other deep structures and excavations.	Possible	Minor	Low	Ground investigations and remediation (as required) would be completed prior to the site being redeveloped/constructed. Deep excavation and piling would be minimised.	Highly unlikely	Negligible
Made Ground and Head Deposits - perched groundwater contamination	Creation of vertical groundwater pathways between aquifers through piled foundations, other deep structures and excavations.	Possible	Moderate	Medium	Deep excavation and piling would be minimised. If saturated material encountered then this will contained and if contaminated remediated as appropriate.	Unlikely	Low
General construction activities – increased fines	Ground disturbance and vibration increasing the amount of fines, with the potential to increase turbidity in the groundwater.	Possible	Moderate	Medium	Limit works to areas away from the Western Adit. Water table deep (>30m below ground level), and so some attenuation of fine material. No new deep works near to adit.	Unlikely	Low

Table 4.7 Determination of Hydrogeological Risks - Operational

Potential Source/Hazard	Mechanism	Likelihood	Consequence	Risk	Mitigation	Revised Likelihood	Residual Risk
Water treatment facility	Leakage from on-site waste water lagoon and treatment plant.	Possible	Moderate	Medium	Lagoons constructed to high standards and monitored. Discharge of treated water and clean water to Pegwell Bay rather than to ground with appropriate monitoring of water quality.	Highly unlikely	Low
Fuel and chemical storage	Leakage from fuel storage tanks and/or loading and off loading facilities:						
	- aviation fuel	Possible	Major	High	All storage tanks will be appropriately designed to current standards (e.g. double skinned, bunded etc.) design of required tank bunds to provide minimum 110 per cent storage capacity based on largest tank capacity with allowance for 1:100 rainfall event. Fuel farm to have comprehensive areas of hardstanding across the site with an associated active drainage capture system to collect all surface drainage and hence any leaks	Highly unlikely	Low
	- other chemicals.	Possible	Moderate	Medium		Highly unlikely	Low
De-icing storage and use	De-icing chemical storage and application to planes, runway and taxiways.	Highly likely	Moderate	High	Application in designated areas with active drainage areas where run-off is led to water treatment lagoons. The lagoons will be appropriately sized to account for NPPF climate change allowances, to ensure that treatment facilities continue to function	Unlikely	Low
Re-fuelling	Spillage during re-fuelling.	Likely	Minor	Medium	Re-fuelling be to in designated areas with active drainage areas with fuel interceptors: use of control levels and alarms to identify leaks or overflows etc.	Highly unlikely	Negligible
Aircraft maintenance	Spillage of cleaning fluids, solvents and or fuels.	Possible	Moderate	Medium	Appropriately designed facilities with hardstanding and contained drainage system with interceptors as required.	Unlikely	Low
Emergency Water Use/fire-fighting	Fire water disposal.	Possible	Minor	Low	Application in designated areas with active drainage areas where run-off is lead to water treatment lagoons.	Unlikely	Negligible
Fire-fighting training	Spillage from fire-fighting training ground.	Possible	Moderate	Medium	Fire-fighting training ground would be appropriately sized, using a lined (impermeable base) hardstanding and with a perimeter bund.	Unlikely	Low
Pesticide application	Application to free draining areas.	Unlikely	Moderate	Low	Pesticides only applied to hardstanding areas with active drainage to water treatment works.	Highly unlikely	Low
Foul drainage	Leakage from foul sewer connections.	Unlikely	Minor	Negligible	All foul drainage pipework to be surveyed to allow the identification of leaks/failures; these would be repaired to meet modern standards.	Highly unlikely	Negligible
Surface Drainage system including car parks	Pollution of and leakage from the drainage network.	Possible	Minor	Low	Drainage would be upgraded to modern standards and all flow collected in appropriately sized attenuation pond(s) and treated prior to discharge off site. Facilities would allow the interception and segregation of contaminated water and cleaner water (e.g. roof run-off). Ponds would be monitored for possible leakage.	Unlikely	Negligible
Existing soakaways	Some areas of the site drain to existing soakaways that are a potential route for contaminated water to enter the aquifer.	Possible	Moderate	Medium	All existing soakaways to be decommissioned and infilled	Unlikely	Low
Historical activities – soil contamination	The site has been used as a military airbase in the past century and light industrial activities linked to the operation of the site. Past activities may have produced historic ground contamination at the site. Possible vertical and lateral pathways may exist to the underlying aquifer.	Possible	Moderate	Medium	Water table deep (>30m below ground level) and earthworks are expected to be in dry material. No new deep boreholes to be constructed. Ground investigations and remediation (as required) would be completed (prior to the site being redeveloped/constructed.	Highly unlikely	Low

5. Conclusions

5.1 Site setting and history

5.1.1.1 Manston Airport has been an airport for approximately 100 years with the level of activity increasing significantly from World War 2. The airport has not been active since 2014. The adjacent Lord of the Manor PWS source dates from the 19th Century and the Western Adit was built in 1923.

5.1.1.2 The Manston site is located over the Thanet Chalk Block which has been the subject to a number of hydrogeological studies and therefore the conceptual groundwater environment is understood with some confidence. There are no surface watercourses in the vicinity of the site, and under natural conditions groundwater flow in the Thanet Chalk Block is approximately radial from the high ground south of Margate, and with flow broadly from north to south under Manston Airport towards Pegwell Bay.

5.1.1.3 Across the Thanet Chalk Block current groundwater quality does not meet drinking water standards due to the high level of nitrate, and therefore water treatment is required. Water quality records suggest that there has also been infrequent contamination from solvents and pesticides. However, records do not identify either significant or persistent contamination that can be attributed entirely to past activities at the airport, although it is possible that some incidents may have gone unrecorded. Some residual contamination leading to low concentrations of TCE when water levels are high has been identified.

5.1.1.4 The Southern Water Lord of the Manor source, together with three others sources, are the major supply of PWS in Thanet and therefore have high strategic importance, although the Lord of the Manor source has not been used since 2010. The SPZ associated with the Lord of the Manor PWS extends to include the Manston Airport site, and the presence of the Western Adit that runs approximately along the line of the runway leads to an extension of the SPZ1 into this area.

5.1.1.5 Under pumping conditions at Lord of the Manor, the Western Adit captures the majority of the groundwater flowing from the north. Any contamination of the groundwater by activities to the north, including across the Manston Airport site and the wider catchment, may result in poor water quality at the Lord of The Manor. Groundwater modelling has shown that only a small proportion of water from the south flows to the adit.

5.1.1.6 Given the location of the site, its proximity to the Lord of the Manor source and Western Adit, and the strategic important of the source, then a HIA has been undertaken.

5.2 Hydrogeological Risk Assessment

5.2.1.1 A qualitative risk assessment has been undertaken for the Manston Airport development in relation to groundwater. The assessment first summarises the geology, hydrology and hydrogeology. This information is then used to develop a conceptual site model that identifies the potential sources of contamination, pathways and receptors.

5.2.1.2 Consultation with the EA and Southern Water has confirmed the conceptual model and the likely hazards, with the proposed fuel farm being identified as the largest single hazard. The Chalk aquifer and, in particular, the Lord of the Manor source has been identified as the key receptor.

5.2.1.3 The risk assessment assumes that no new potentially polluting activities will occur in the SPZ1. The hazards are all assessed as potentially occurring in SPZ2.

5.2.1.4 The hydrogeological risk assessment has examined those hazard events that could result in a release of contaminants to the environment, the consequence of the release and the likelihood of the event occurring. A number of significant hazard events have been identified, and for each an appropriate set of mitigation measures (safeguards) have been proposed such that the residual risk is concluded in most cases to be low or negligible.

5.2.1.5 The possible exception is a hazard event associated with failure of aviation fuel tanks which coincides with a failure of a bund and/or impermeable surface or significant leak at the fuel farm contaminating the aquifer. With the proposed mitigation measures the likelihood of this event is considered to be highly unlikely. The groundwater modelling has shown that the majority of groundwater flow under the proposed fuel farm site is southward away from the adit and although, the consequence is considered to be major nevertheless the residual risk is assessed as low.

5.2.1.6 The risk from leakage from fuel tanks could further be reduced by:

- regular inspection of tanks and operating facilities and tank integrity monitoring programme would be required;
- regular inspection of bunds and impermeable surfaces;
- implementation of strict fuel delivery and control systems; and
- detailed emergency response procedure/plan in the event of a failure.

5.3 Summary

5.3.1.1 The past history of use of the site as an airport does not appear to have resulted in any significant water quality issues, and therefore continued use of an airport employing modern environmental measures should ensure that future water quality issues are minimal.

5.3.1.2 The new development will not result in any new activities that will introduce additional hazards. The application of modern standards, improved drainage and regular monitoring and maintenance will ensure that the risk to groundwater is low or negligible.

5.3.1.3 All development associated with the airport that is within the catchment area to this source should implemented to the highest standards to ensure that the risk of contamination is kept to a minimum. Appropriate training and awareness to be given to all staff involved in the development and construction.

5.3.1.4 The on-site storage of aviation fuel has been identified as the one area of medium risk and as such this aspect of the development should be subject to the most stringent mitigation measures and controls which adopted allows this residual risk to be assessed as low.

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Appendix A Minutes of meetings with Environment Agency and Southern Water

Appendix B
Flowsource analysis of catchment to Lord of the Manor

Insert pdf of

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Key

Application boundary

0 1,000 2,000 3,000 m

Scale at A3: 1:50,000

Client

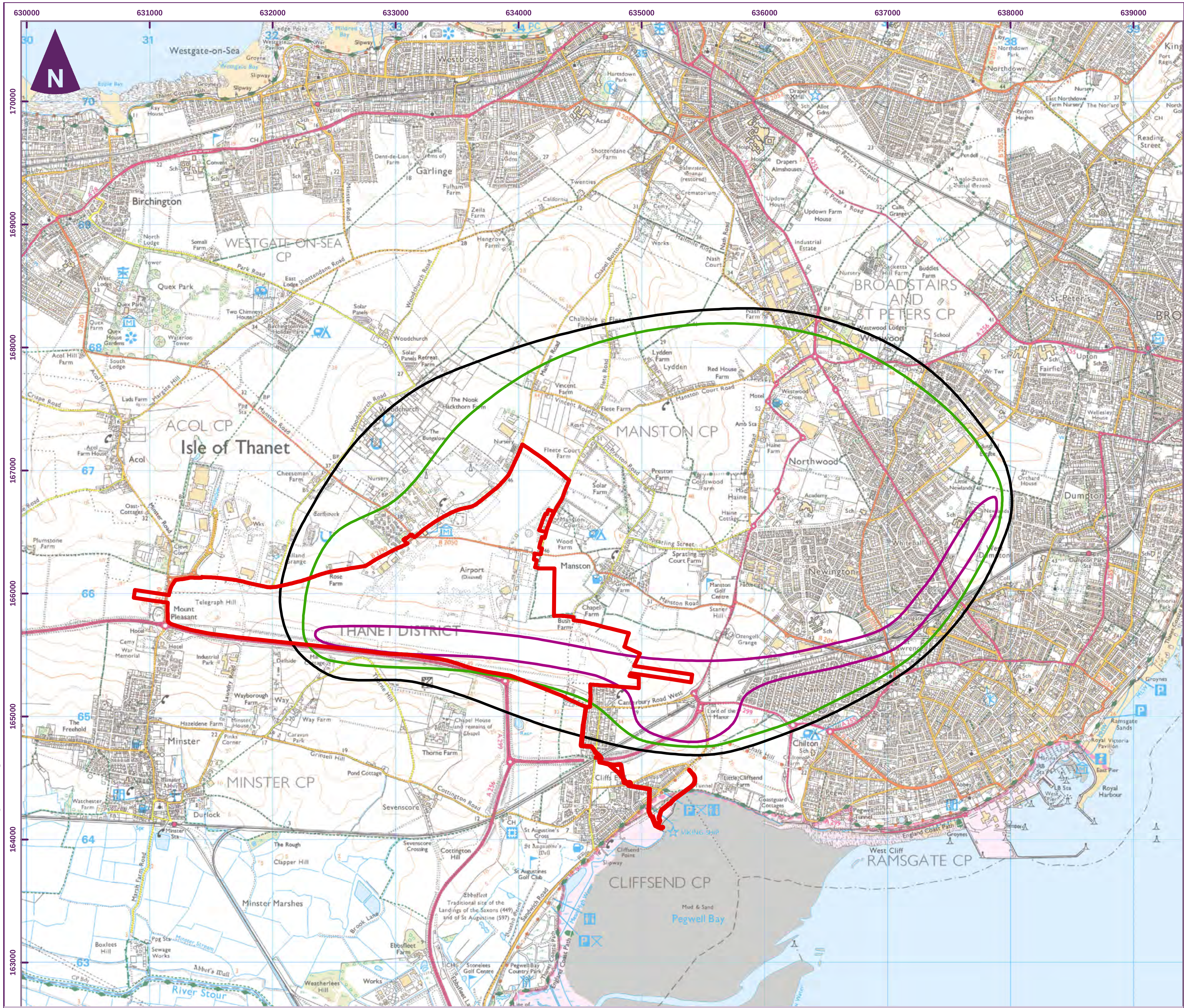
RSP

Manston Airport DCO
PEIR
Hydrogeological Risk Assessment

amec foster wheeler

Figure 1.1
Site location plan

December 2017 38199-Lon212.mxd parkj



Based upon the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. 100001776.

file: H:\Projects\38199 LON Manston Airport DCO EIA\Drawings\ArcGIS\Figures\38199-Lon217.mxd

Key

- Application boundary
- Total capture zone
- Inner zone (50 days to borehole)
- Outer zone (70% of abstraction)

0 0.5 1 1.5 km

Scale at A3: 1:30,000

Client

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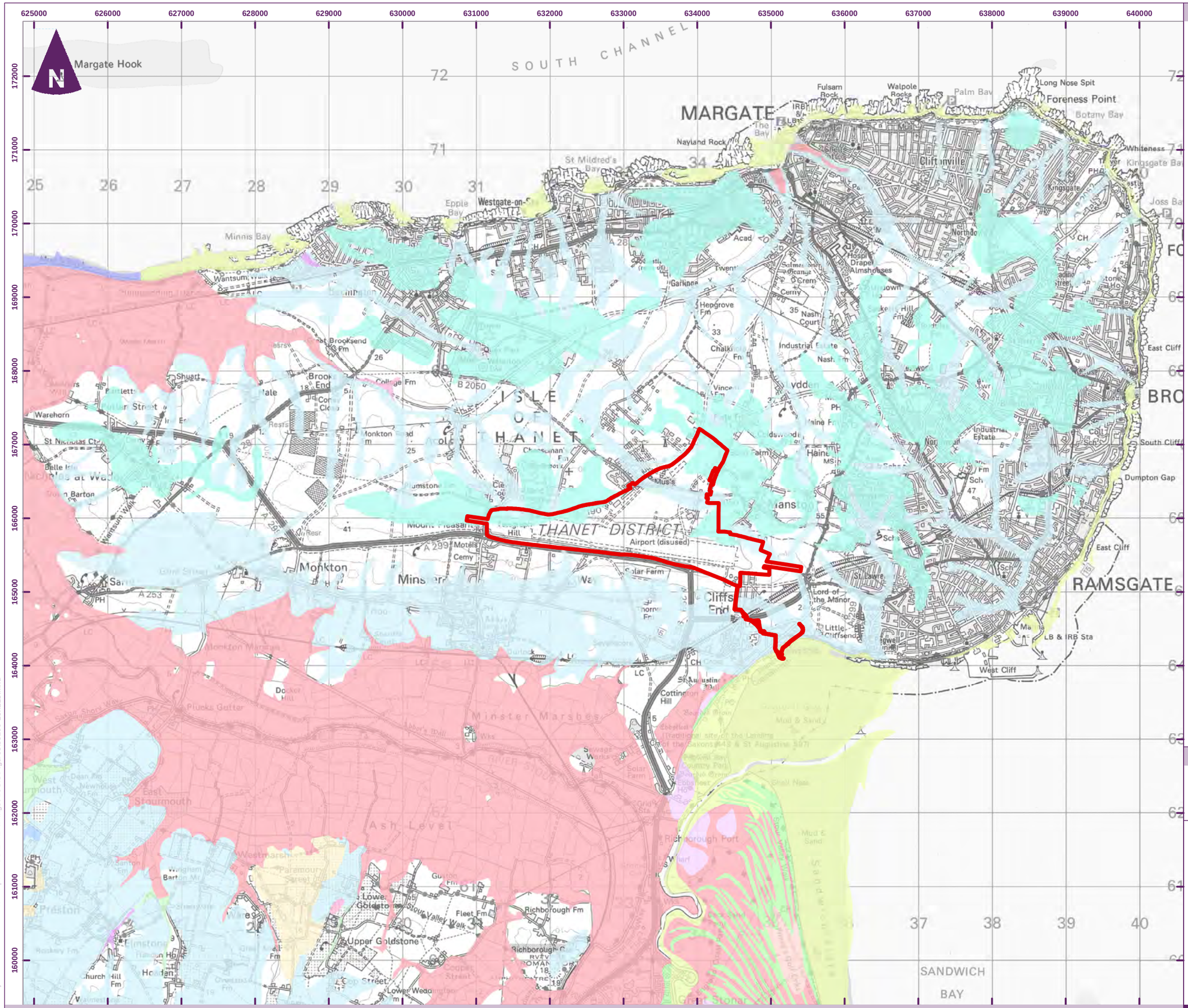
Figure 3.1
Flowsource catchment to the Lord of the Manor PWS

December 2017 38199-Lon217.mxd parkj



Key

Application boundary

Superficial Geology

- Alluvium - clay, silt, sand and gravel
- Alluvium - clay, silt, sand and peat
- Beach and tidal flat deposits (Undifferentiated) - Clay, silt and sand
- Beach and tidal flat deposits (Undifferentiated) - Sand and gravel
- Beach and tidal flat deposits (Undifferentiated) - Sand, silt and clay
- Blown sand - sand
- Head - clay, silt, sand and gravel
- Head - gravel, sand, silt and clay
- Head 1 clay and silt
- Head 2 clay and silt
- River terrace deposits 2 - sand and gravel
- Storm beach deposits - sand and gravel
- Tidal flat deposits - clay and silt

0 0.5 1 1.5 2 2.5 km

Scale at A3: 1:50,000

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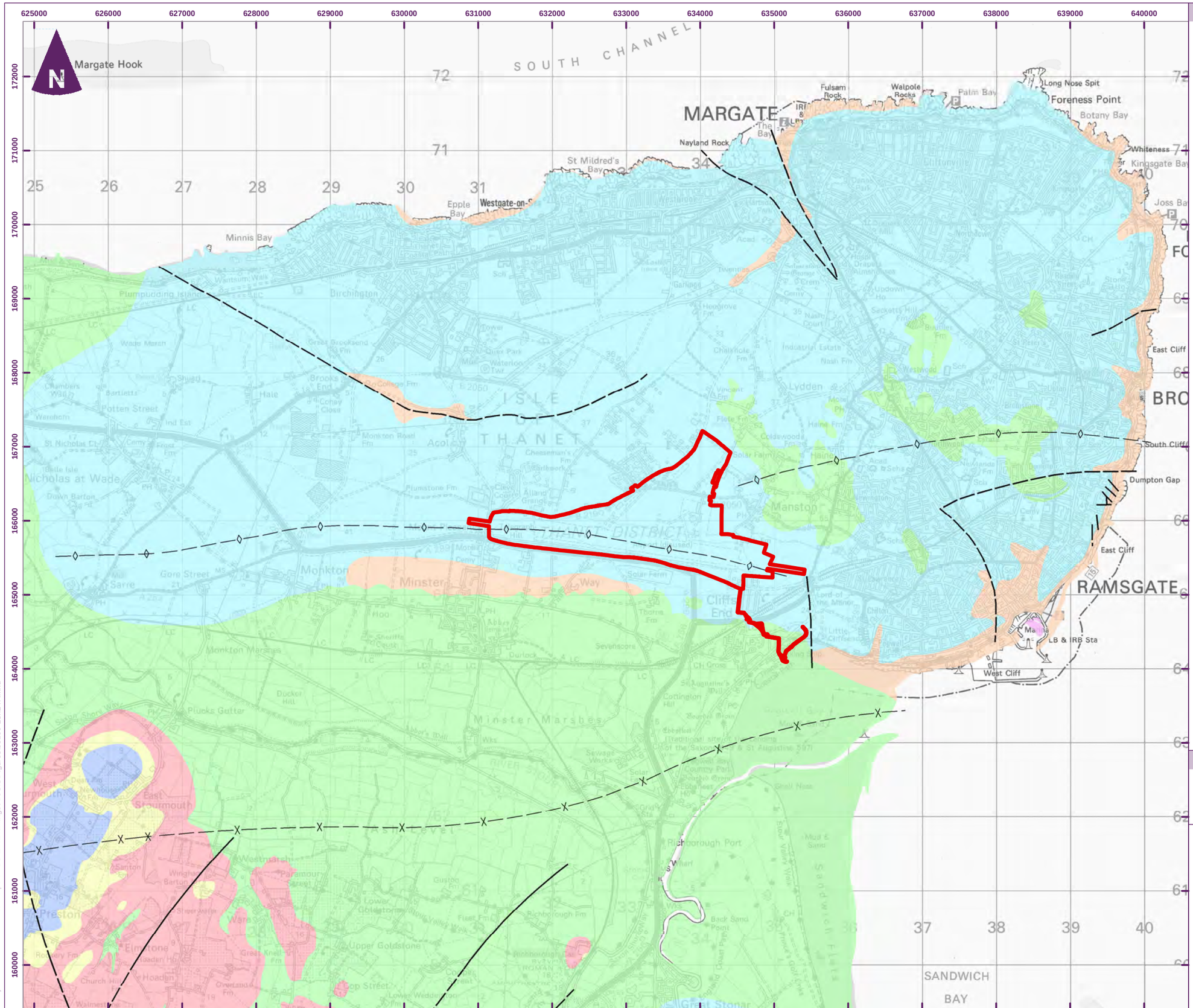
Figure 3.2a
Geological map of North Kent - superficial deposits

December 2017 38199-Lon213.mxd parkj



Key

- Application boundary
- Fault: inferred Downthrow unspecified
- Fault: observed downthrow unspecified
- Fold anticline
- Fold Syncline

Bedrock Geology

- Harwich Formation - sand and gravel
- Lambeth Group - sand
- Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated) - chalk
- London Clay Formation - clay and silt
- Margate Chalk member - chalk
- Seaford Chalk Formation - chalk
- Thanet Formation - sand, silt and clay

0 0.5 1 1.5 2 2.5 km

Scale at A3: 1:50,000

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Figure 3.2b
Geological map of North Kent - bedrock

December 2017 38199-Lon247.mxd parkj

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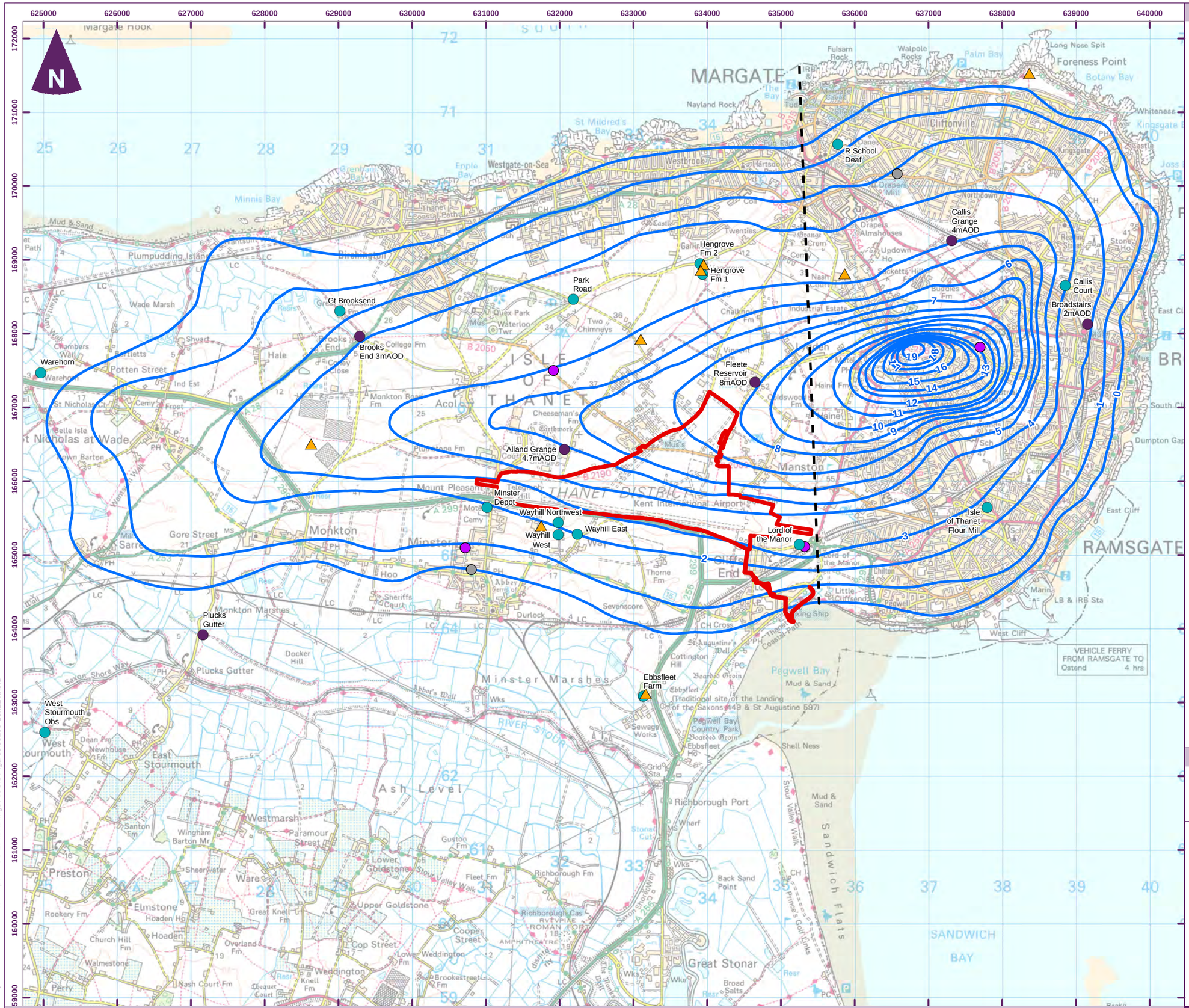

Key

- Application boundary
- Groundwater contours (mAOD)
- Licensed groundwater abstraction

Water level monitoring

- Current
- Disused

SWS Abstractions

- Current
- Disused
- Line of section used in Figure 4.1

Scale at A3: 1:50,000

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Figure 3.3
Groundwater contours November 2007 (after Atkins 2014)

628000 629000 630000 631000 632000 633000 634000 635000 636000 637000 638000 639000

172000 171000 170000 169000 168000 167000 166000 165000 164000 163000 162000

N

MARGATE
Westgate-on-Sea
Birchington
BIRCHINGTON CP
WESTGATE-ON-SEA CP
Garlinge
Westbrook
Cliftonville
Foreness Point
Kingsgate
BROADSTAIRS AND ST PETERS CP
BROADSTAIRS
MAINSTON CP
Northwood
Dumpton
East Cliff
RAMSGATE
West Cliff
RAMSGATE CP
CLIFFSEND CP
Pegwell Bay
ACOL CP
Isle of Thanet
Acol
Manston
Airport (Closed)
MONKTON CP
Monkton
THANET DISTRICT
Minster
MINSTER CP
Durlock
Monkton Marshes
Minster Marshes
Ash Level
River Stour

Sparrow Castle Acol Borehole 1

Rumfelds

Minster Iot Borehole B

Lord Of The Manor Well 1

Key

- Application boundary
- Southern Water groundwater abstraction

Source Protection Zones

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

0 500 1,000 1,500 2,000 m

Scale at A3: 1:40,000

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Figure 3.4
Location of Southern Water Sources and associated SPZs

December 2017 38199-Lon215.mxd parkj

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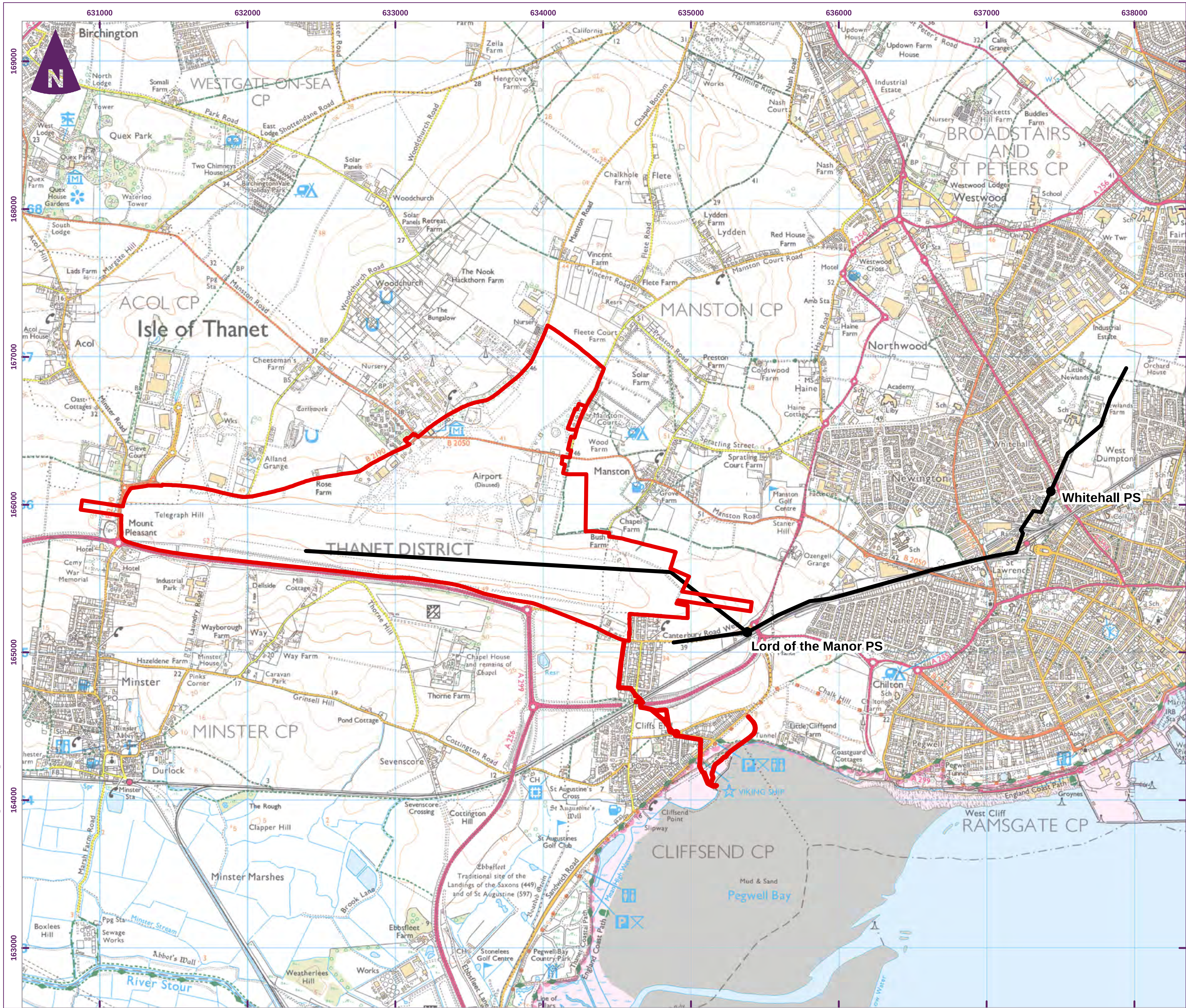

Key

Application boundary

Adit location

Shaft location

0 500 1,000 1,500 m

Scale at A3: 1:25,000

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Figure 3.5
Location of the Lord of the Manor PWS adits

December 2017 38199-Lon216.mxd parkj

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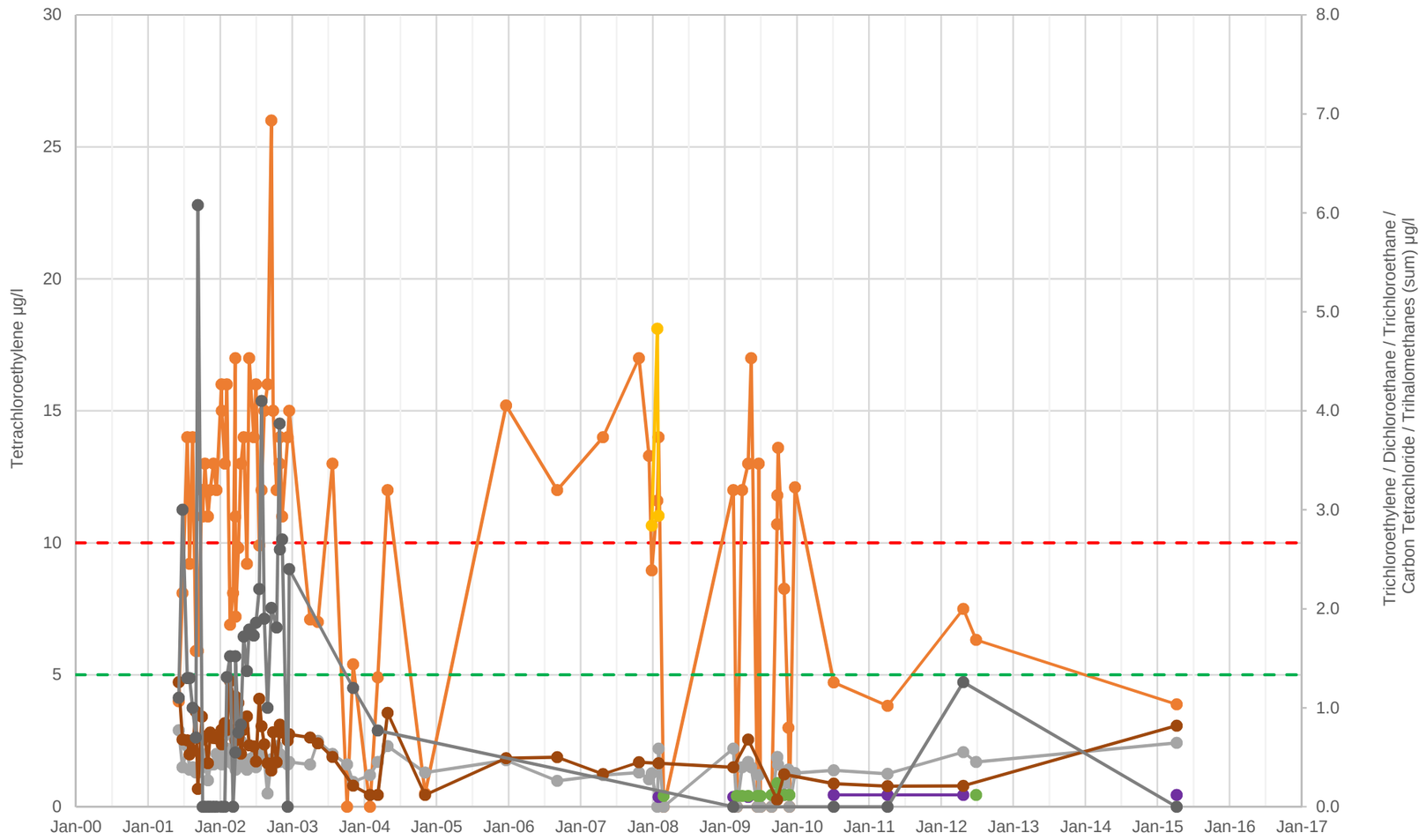

Key

- DWS Sum of Trichloroethane and Tetrachloroethane
- Tetrachloroethene
- Trichloroethene
- DWS Vinyl Chloride
- Dichloroethane (1,2)
- Trichloroethane (1,1,1)
- Vinyl Chloride
- Carbon Tetrachloride
- Trihalomethanes (Sum of Identified THMS)

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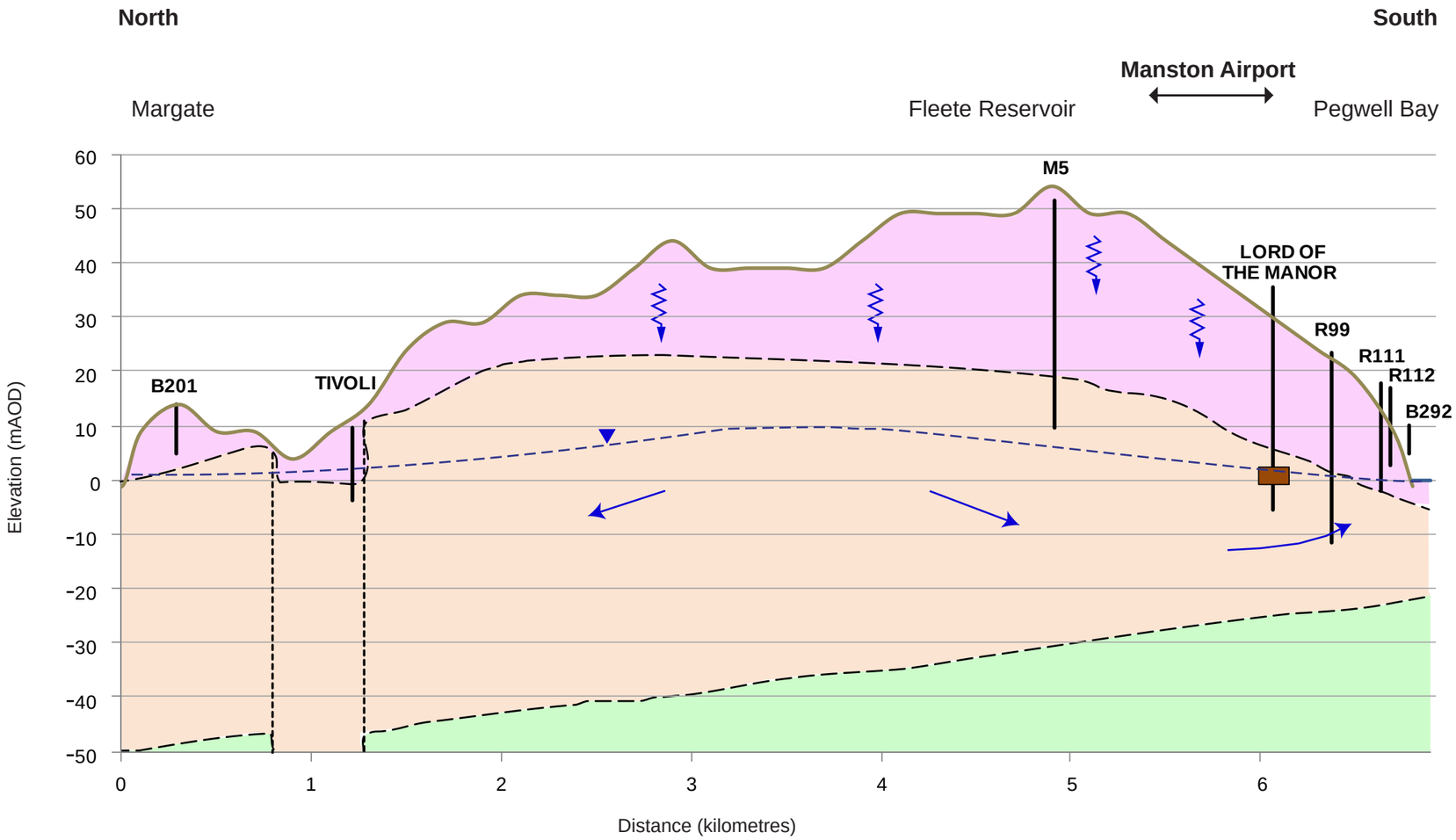
Figure 3.6
Solvent concentrations at Lord of the Manor



Key

- Ground surface
- Newhaven Chalk Formation
- Seaford Chalk Formation
- Thanet Formation
- Faults
- Sea
- Borehole
- Adit levels (-0.7 - 2.8mAOD)
- Water table
- Groundwater flow direction
- Recharge

Note: Borehole Ref Nos from Atkins (2014)

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Figure 4.1
Conceptual cross section (from Atkins 2014)

Key

Application boundary

0 10 20 30 40 50 m

Scale at A3: 1:1,000

Client

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PEIR
Hydrogeological Risk Assessment

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Figure 4.2
Jentex fuel storage facility

January 2018 38199-Lon259.mxd parkj

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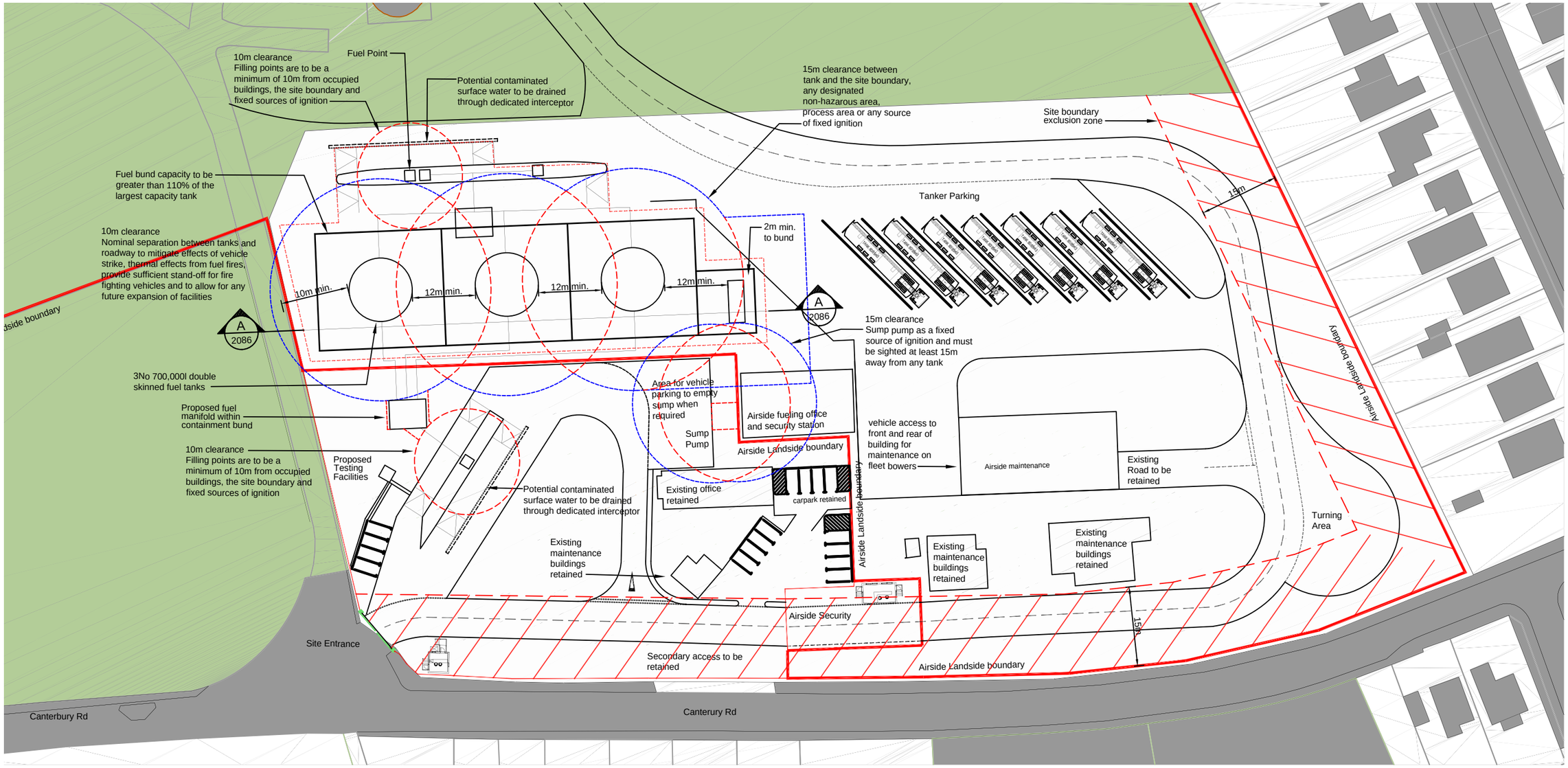

Key

- Airside / Landside Boundary
- Enveloped Exclusion Zone
- Individual Exclusion Zone

Notes

1. OS Data obtained from emapsite$_{TM}$ May 2017:
   © Crown copyright and database rights 2017 Ordnance Survey 0100031673

2. To reduce the risk of a discharge of fuel into public waterways, the fuel tank bunds have been provided with a sealed drainage system. All liquids in these areas will be contained within a sealed network. The captured discharge will be tested and either released into the drainage network or disposed off site by suitable means.

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PEIR
Hydrogeological Risk Asssement

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Figure 4.3
Manston Fuel Farm layout

Appendix 8.2

RiverOak Strategic Partners

Manston Airport DCO

Flood Risk Assessment

January 2018

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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Doc Ref. 38199CR058i1

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Document revisions

No.	Details	Date
i1	Draft for review	17/11/17
I2	Final for review	29/11/17
I3	Final	05/01/17

Contents

1. Introduction

1.1 Context

1.1.1 This Flood Risk Assessment (FRA) is submitted on behalf of Riveroak Strategic Partners (RiverOak) who are seeking consent for development at Manston Airport through a Development Consent Order (DCO).

1.1.2 A Preliminary Environmental Information Report (PEIR) was prepared by RiverOak and consulted upon in summer 2017 (PEIR, 2017) by RiverOak as part of the consultation process and, amongst other things, it addressed the water environment. Following the introduction of the Infrastructure Planning (Environmental Impact Assessment) Regulations (2017 Regulations) a revised PEIR (PEIR, 2018) has been prepared reflecting the latest available information and introducing a number of additional topics in accordance with the 2017 Regulations.

1.1.3 This FRA has been prepared in support of the Freshwater Chapter of the 2018 PEIR and will form part of the Environmental Statement (ES) to be submitted later in 2018.

1.1.4 The development proposals for Manston Airport include the following key elements:

- Upgrading the runway and improving the Alpha parallel taxiway;
- Constructing 19 new air cargo stands;
- Completely re-fitting the airfield navigation aids;
- Replacing the existing fire station and constructing a new fire training area;
- Building new air cargo facilities;
- Upgrading the existing Jentex site to serve as the airport fuel farm;
- Developing a new air traffic control service and demolition of the current air traffic control tower;
- Developing areas of the 'Northern Grass' for airport related businesses; and
- Highway improvement works to ensure improved access to and around Manston, including a new permanent dedicated airport access on Spitfire Way which will help to reduce airport related traffic on the local road network.

1.1.5 This FRA has been prepared in accordance with the Revised Draft Airports National Planning Statement (NPS), National Planning Policy Framework (NPPF) and Planning Practice Guidance note 14. With regard to flood risk, the NPS repeats the advice set out in the NPPF. The NPS states (at paragraph 5.150) that a site-specific FRA is required for development proposals of 1 hectare or greater in Flood Zone 1, all proposals for new development located in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency (EA)).

1.1.6 The EA Flood Risk map classifies 100% of the site as being in Flood Zone 1, defined as having a less than 0.1 % annual exceedance probability (AEP) of fluvial or tidal flooding. However, the site is larger than one hectare; therefore an FRA is required. No watercourses (Main River or Ordinary Watercourse) pass through or run alongside the site. At present surface water from the site drains to the coast at Pegwell Bay, or is discharged into surface water sewers.

1.1.7 The main purpose of this FRA, as detailed in the NPS and NPPF, is to demonstrate how flood risk to the proposed development and any increased flood risk to third parties due to the development, will be managed over the lifetime of the development, taking climate change into account.

1.2 Structure of this Report

1.2.1 The report is structured as follows:

- Section 2 - Site Description;
- Section 3 - Development Proposals;
- Section 4 - Planning Context;
- Section 5 - Flood Risk Appraisal: this provides an initial assessment and a summary of the various sources of flood risk to the proposed development site;
- Section 6 - Drainage Strategy: this section details the surface water drainage strategy and provides details of any mitigation required to limit surface water run-off;
- Section 7 - Flood Risk Management and Mitigation: this section details the measures to be taken to manage and mitigate flood risk; and
- Section 8 - Conclusions.

1.2.2 Supporting documents are presented at the end of the report in the form of a drainage strategy within an appendix. This includes:

- The drainage strategy;
- Site plans;
- A topographic survey;
- Evidence of the consultation process;
- Utility asset location plans;
- Calculation of greenfield runoff rates; and
- A conceptual drainage layout.

1.3 Sources of Data and Information

1.3.1 This FRA has made use of the following information sources

- Draft revised Airports National Planning Statement (October 2017);
- National Planning Policy Framework (2012).
- Technical Guidance to the National Planning Policy Framework (2012).
- Planning Practice Guidance – Flood risk and Climate Change (2014)
- Environment Agency website www.environment-agency.gov.uk; 'What's in your backyard' (2017).
- CIRIA, C753. The SUDS Manual, (2015).
- Kent County Council Preliminary Flood Risk Assessment (2011)
- Kent County Council Surface Water Management Plan Thanet Stage 1 Surface Water Management Plan (2012)
- Kent County Council Local flood risk management strategy (2013)
- Thanet District Council Strategic Flood Risk Assessment (2009)

- Thanet District Council (2017), Thanet District Council Local Plan Core Strategy [Accessed online on 09/11/2017 at https://www.thanet.gov.uk/your-services/planningpolicy/ thanets-new-local-plan/what-is-the-new-local-plan/]

2. Site Description

2.1 The Site

2.1.1 The existing site consists of Manston Airport and an area to the north of the B2050 and includes:

- A 2748m east-west aligned runway;
- A taxiway network;
- Aircraft stands (aprons);
- A terminal building;
- Cargo facilities; and
- An air traffic control tower.

2.1.2 The site includes an additional area to the north of the B5020 which is known as the Northern Grass. This area was not previously part of the airport. It also includes the Jentex site to the southeast. This is currently a fuel storage depot, which would be developed as the airport fuel farm.

2.1.3 The development site area is approximately 320 hectares.

2.2 Topography

2.2.1 The Isle of Thanet comprises an area of approximately 70 km^2 extending 12 km east-west by 4.5 km north-south in the west and 9 km north-south in the east. It is bordered by the sea to the north, east and south and by the River Stour and the River Wantsum to the west.

2.2.2 Its landform consists of a plateau that slopes gently westwards from the 30m high cliffs at the coast to an elevation of 10 m above Ordnance Datum (AOD) in the west at the edge of the River Stour valley. The highest area is located around the airfield site where elevations reach 55 m AOD. To the west and south, the flat expanse of the River Stour valley has an elevation of only 2 m AOD and in some areas is below sea level.

2.2.3 The site is mainly situated at an elevation between 45 to 50 mAOD. The southern portion is located at an elevation of approximately 50 mAOD, along the length of the runway, but rises to approximately 55 mAOD in the western most corner of the site. North of the runway the site declines to approximately 40 mAOD in the west, at the crossroads of the B2050 and the B2190, forming the start of the headwater valley for the Brooksend Stream, while remaining at 45 to 50 mAOD in the northern most part of the site.

2.3 Hydrology, Drainage, Geology, Hydrogeology and Soils

2.3.1 The average annual rainfall recorded at Manston between 1981 and 2010 is 592.5 mm[1].

2.3.2 There are no perennial watercourses on the Isle of Thanet as the area is underlain by permeable chalk rock which permits infiltration of all rainfall.

2.3.3 There are no watercourses on or adjacent to the site. A series of water channels and streams that form part of the Minster Marshes lie more than 1 km to the south of the site. This marsh drains south into the River Stour, 3 km south of the site, which flows east and into Sandwich and Pegwell Bays. Ordnance Survey (OS) mapping shows a drainage channel on the opposite side of the road to the northern most point of the site. This is possibly associated with a plant nursery (Rosemary Nurseries) adjacent to the site.

2.3.4 OS mapping indicates a number of reservoirs within 3 km of the site. A number of small uncovered reservoirs are approximately 1.5 km or more from the western most boundary of the site. A covered reservoir is approximately 0.5 km north of the site, and a further uncovered reservoir lies 0.3 km from the southern site boundary.

2.3.5 There are a number of other small water features (e.g. ponds) within 3 km of the site.

2.3.6 There are no public surface water sewers within the site. The closest Southern Water sewer is a combined sewer north east of the site in the village of Manston immediately north of the main site.

2.3.7 The site is currently served by a private surface water network that drains to a pumping station immediately south of the B2050. This is believed to convey surface water runoff towards a chamber in the west of the site, next to the existing runaway. From the chamber, all surface water runoff collected from the site flows via gravity towards an outfall into Pegwell Bay, 2 km south-east of the site boundary.

2.3.8 The outfall pipeline, starting from the southeastern edge of the site is approximately 1.8 km long.

2.3.9 A CCTV survey of the outfall pipeline was undertaken by RPS in April 2017. This found, that apart from debris in some sections, the overall condition of the outfall pipeline is good. The headwall of the outfall is at Pegwell Bay. A screen consisting of flat bars at approximately 100 mm spacing is attached at the end of the headwall. A channel approximately 14 m long flows directly from the headwall to the sea. At the time of a site walkover in 2017 the channel was partially buried by sand.

2.3.10 The Isle of Thanet is underlain by the middle sequence of the Upper Chalk Formation (White Chalk sub-group). The outcrop chalk units are the upper Newhaven Chalk, the Seaford Chalk and the Lewes Nodular Chalk. The chalk is more than 200 m thick in the area of the site. The chalk is underlain by Gault Clay.

2.3.11 The chalk is either at outcrop or is overlain by the sands and silts of the Thanet Formation and Head deposits (composed mainly of interglacial wind-blown silts). The Thanet Formation is potentially present in the north-east of the site. Made Ground deposits are also anticipated to be present in many areas of the site.

January 2018
Doc Ref. 38199CR058i1

[1] Source: Met Office

January 2018
Doc Ref. 38199CR058i1

2.3.12 The main aquifer under the Isle of Thanet is the chalk of which approximately the upper 70 m is productive and supplies the majority of the public abstraction sources (classified as a Principal Aquifer). The public water supply wells on the Isle of Thanet are connected to adits. The adits are generally at levels at around 2 to -4 mAOD, (40-50 metres below ground level), which is likely to be the zone of maximum productivity.

2.3.13 The Thanet Formation is classified by the EA as a Secondary Aquifer but, if present at the site is likely to be unsaturated. The base of the chalk aquifer is the low permeability Gault Clay Formation which is classified as non-productive strata.

2.3.14 Recharge is predominantly via rainfall at the chalk outcrop where soils are light and permeable. Recharge is thought to be uniform across the exposed chalk irrespective of soil type. Recharge also occurs via the semi-permeable Thanet Formation. In urban areas rainfall recharge will be reduced but there will be additional recharge inputs from leaking sewers and water mains.

2.3.15 Given the permeable nature of soils and the chalk, runoff is not expected to occur and all rainfall to soil is anticipated to infiltrate. The site topography means that there are no up topographic gradient areas with the potential to generate run-off that would flow on to the site.

2.3.16 The site is located entirely within a groundwater Source Protection Zone (SPZ) catchment to the Lord of the Manor public water supply abstraction operated by Southern Water. The inner zone (SPZ1) forms a strip beneath the runway, and is coincident with the line of the western adit feeding the Lord of The Manor source. This is surrounded by a wider outer zone (SPZ2) that also dominates the area beneath the runway, in the south of the site. The remainder of the site falls within the wider SPZ catchment area (SPZ3).

3. Development Proposals

3.1 Overview

3.1.1 The aim of the project is to revive Manston Airport as an airfreight hub of national significance, with complementary passenger and engineering services. The focus will be to provide a dedicated airfreight facility capable of handling in excess of 10,000 air traffic movements of air freight cargo per year. The proposed layout general arrangement overall plan is shown in Appendix B.

3.1.2 The existing 2748m east-west aligned runway will be retained and upgraded. An assessment of the runway condition will be undertaken but it is likely that it will require rehabilitating to improve the load bearing capacity. The likely rehabilitation method will be an overlay using bituminous materials.

3.1.3 The existing taxiway network will need modifications to comply with EASA (European Aviation Safety Agency) guidelines. These include a new taxiway parallel to the runway, new taxiways linking aprons and stands and modifications to existing taxiways to ensure the gradient is compliant with EASA guidelines.

3.1.4 The passenger apron to the west of the terminal building will be retained. Two new areas of apron will be constructed between the runway and B2050 Manston Road. These will cover approximately 208,000 m^2 to provide parking for up to 18 aircraft. These facilities will be able to accommodate the larger types of aircraft, classified as Codes E & F, which many air freight operators currently use. The apron areas will incorporate 'slot drains' to collect surface water runoff.

3.1.5 Cargo facilities in the north east of the site will be relocated; new airside cargo facilities and car park and storage areas will be constructed immediately to the north of the new cargo aprons with direct access to a new aircraft apron area. The new cargo facilities will cover approximately 65,000 m^2. New storage and parking areas will cover approximately 129,000 m^2 (Appendix B). Due to the topography and the requirement for revised taxiway and apron gradients this area will require regrading to provide a building platform (Appendix B).

3.1.6 Facilities for secondary supporting aviation uses, including aircraft maintenance, repair and overhaul (MRO) and limited passenger services will also be provided (Appendix B). Passenger facilities will a new terminal and passenger apron, with sufficient space for up to four additional aircraft stands if required. The existing MRO facility will be replaced with a new facility capable of accommodating two of the largest types of aircraft.

3.1.7 A new fuel farm facility, incorporating best practice in the design and management of fuel storage such as above ground and bunded fuel tanks, will be constructed (Appendix B). For ease of access the facility will be located airside within the new areas of development.

3.1.8 Additional utility services will be required; these are likely to include internal sub-stations, communication networks, and foul and surface water connections.

3.1.9 The surface water network will include interception, attenuation and pollution control facilities designed in accordance with industry good practice and agreed with key stakeholders. Where appropriate Sustainable Drainage Systems (SUDS) will be used. Discharge would be to the existing permitted outfall to Pegwell Bay. An outline drainage layout is shown in Appendix A.

3.1.10 A new airport access for the cargo/aircraft maintenance facility is proposed on the B2190 (Spitfire Way) to the west of the existing access (Appendix B). This will link in with proposals for highways improvements by Kent County Council Highways Department. RiverOak will work with them to provide improved access in and around the airport, for example to deliver improvements to the junction of Manston Road and Spitfire Way. A landscaping zone

between the new internal access road and the public highway will be provided to screen the development.

3.1.11 The two museums on the site, the RAF Manston Museum and the Spitfire and Hurricane Memorial Museum, will be located in a new museum area. The old air traffic control tower building, located to the east of the Spitfire and Hurricane Memorial Museum will be converted to provide a new café and observation area (Appendix B).

3.1.12 The area north of Manston Road, referred to as the 'Northern Grass' will be used for other aviation-related purposes such as warehousing, offices and airport related business units, but will have no direct access for aircraft (Appendix B). The requirements for facilities airside mean that there will be limited space within the main site for expansion of aviation-related businesses, and activities that can be located landside will be located here. Initial proposals for this area indicated that it could support multiple business units of various sizes and layouts with an approximate total floor spaces of 1,400,000m2. The DCO application will include proposals based on outline design parameters. A safeguarding zone around the airport radar installation will be retained. The size of this area will be dependent on the type and specifications of the radar.

3.2 Airport construction phase

3.2.1 The initial phase of construction, which will commence following the grant of the DCO, focusses on returning the airport to operation and reusing as much of the remaining original airport infrastructure as possible. As the airport has not been operational since May 2014 and is unlikely to have been subject to regular maintenance since that date it is likely that this phase will require a period of 6-12 months during which time the essential airport equipment and infrastructure will be maintained where it still exists or installed to bring it back to full use. During this time an application for an Aerodrome Licence will be submitted.

3.2.2 The remaining phases of development will be undertaken in accordance with the emerging and developing business case for the airport. Initially, the airport will operate using the existing infrastructure and cargo facilities. An outline phased development is likely to comprise the following stages:

- Relocate existing facilities located within new development area;
- Install new airside infrastructure (relocate taxiway alpha, new fuel farm);
- Provide new site location access;
- Upgrade site services (electricity, surface water drainage and treatment);
- Improve community facilities (museums and café/observation centre);
- Development, in phases, of new aircraft stands, aprons and cargo facilities as required; and
- Development of Northern Grass area for aviation related businesses.

3.3 Airport operational phase

3.3.1 The air freight operations, which will be the main focus for the airport, are expected to start shortly after reopening. From this initial base the airport would seek to attract additional customers and clients including offering the facilities as the base for one or more freight forwarding and handling companies.

3.3.2 Drawings within Appendix A shows the proposed layout of the development. The future impermeable area has been calculated based on the draft Indicative Masterplan. The site has been divided into three drainage catchments, based on the existing drainage patterns and future development proposals. These consist of the main airport site, the Northern Grass area and the Fuel Farm. Table 3.1 summarises the proposed changes to

permeable/impermeable land uses across the development site. As a result, peak rates and volumes of storm run-off will increase. Additional storage will be required to manage and attenuate flows and to permit treatment of potentially contaminated runoff. The rate at which water will leave the site will be governed by the size of pumps used to transfer water to the outfall and is likely to be the same (if existing pumps continue to be used) or higher (new pumps) than the existing discharge.

Table 3.1 Existing/Proposed Impermeable/ Permeable Split

Drainage Catchment Area (Hectares, Ha)	**Permeable**		**Impermeable**	
	Existing	Proposed	Existing	Proposed
Whole site	221.9	188.36	95.0	131.8

4. Planning Context

4.1 National Planning Policy

4.1.1 The NPS requires that the applicant, the Examining Authority and the Secretary of State in taking decisions should take account of the policy on climate change adaptation as set out in the NPPF and other supporting guidance when considering flood risk.

4.1.2 The NPPF sets out that inappropriate development in areas at risk of flooding should be avoided. In addition, it also advocates that new development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. The extent of any impact will depend on the ability of the development to manage storage of water on or off-site.

4.1.3 The NPS indicates that airport expansion has the potential to result in increased risk from climate change effects, particularly to increased surface water runoff rate and pressure on potable water supply.

4.1.4 The NPS requires a FRA for projects that are:

- In Flood Zones 2 and 3; or
- In Flood Zone 1 where the project is 1 hectare or greater, which may be subject to other sources of flooding (local watercourses, surface water, groundwater or reservoirs), or where the EA has notified the local planning authority that there are critical drainage problems.

4.1.5 The NPS indicates that a FRA should:

- Consider the risk of all forms of flooding arising from the development comprised in the preferred scheme, in addition to the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime;
- Take into account the impacts of climate change, clearly stating the development lifetime over which the assessment has been made;
- Consider the need for safe access and exit arrangements;
- Include the assessment of residual risk after risk reduction measures have been taken into account, and demonstrate that this is acceptable for the development;
- Consider if there is a need to remain operational during a worst case flood event over the preferred scheme's lifetime; and
- Provide evidence for the Secretary of State to apply the Sequential Test and Exception Test,

4.1.6 In addition, site layout and surface water drainage systems should be able to cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts.

4.1.7 The surface water drainage arrangements for any project should be such that the volumes and peak flow rates of surface water leaving the site are no greater than the rates prior to the proposed project, taking into account climate change, unless specific off-site arrangements are made and result in the same net effect.

4.1.8 The sequential approach should be applied to the layout and design of the project. Vulnerable uses should be located on parts of the site at lower probability and residual risk of flooding. RiverOak should seek opportunities where appropriate to use open space for multiple purposes such as amenity, wildlife habitat, and flood storage uses. Opportunities

can be taken to lower flood risk by improving flow routes, flood storage capacity and using sustainable drainage systems.

4.2 Local Planning Policy

4.2.1 The emerging Thanet District Council (TDC) Local Plan (LP) to 2031 Preferred Options Consultation of January 2015 contains the following policy relating to drainage requirements:

4.2.2 Policy CC02: Surface Water Management: "New development will be expected to manage surface water resulting from the development using sustainable drainage systems (SUDS) wherever possible. SUDS design should be considered as an integral part of the masterplanning and design process for new development. Proposals for SUDS at sites within the Groundwater Source Protection Zone as shown on Map 19, or sites near the Groundwater Source Protection Zone, must demonstrate that the methods used will not cause detriment to the quality of the groundwater. Sites identified as a Tidally Sensitive Area (as identified in surface water management plans) will need to incorporate Sustainable Drainage Methods and a maintenance schedule where appropriate, at the design stage of a planning application, and a Flood Risk Assessment will be required before planning permission can be granted."

4.2.3 TDC has produced a Strategic Flood Risk Assessment (SFRA) (TDC, 2009). This identified tidal flooding near the coast and fluvial flooding along the River Stour as having the greatest flood risk in the area. Groundwater flooding was not identified to be of strategic concern. The SRFA did not address flood risks associated with drainage networks.

4.2.4 The SRFA indicates that flood risk should be managed by:

- Avoiding high risk sites;
- Take into account climate change in FRAs;
- Adopt resilient measures for all development at risk of flooding;
- Taking into account wind and wave action for coastal FRAs.

4.3 Other Relevant Plans, Policies and Strategies

4.3.1 Kent County Council (KCC) is the lead local flood authority for Kent. KCC published their Preliminary Flood Risk Assessment (PFRA) in September 2011 (KCC, 2011). This used surface water mapping data provided by the EA to assess the risks in Kent and where further investigations should be prioritised.

4.3.2 To improve the understanding of surface water flood risks (and other local sources of flooding) surface water management plans (SWMP) have been undertaken in areas identified as high risk in the PFRA. The KCC SWMP for Thanet completed in 2012 (KCC, 2012).

4.3.3 The KCC Local Flood Risk Management Strategy (FRMS), (KCC, 2013) has 5 objectives, set out below. They have been developed to be consistent with the National Flood and Coastal Erosion Risk Management strategy and the Vision for Kent, and to address the needs of local flood risk in Kent.

1. Improving the understanding of the risks of flooding from surface runoff, groundwater and ordinary watercourses in Kent.
2. Reducing the risk of flooding on people and businesses in Kent
3. Ensuring that development in Kent takes account of flood risk issues and plans to effectively manage any impacts.

4. Providing clear information and guidance on the role of the public sector, private sector and individuals in flood risk management in Kent and how those roles will be delivered and how authorities will work together to manage flood risk.

5. Ensuring that emergency plans and responses to flood incidents in Kent are effective and that communities understand the risks and their role in an emergency.

4.3.4 Objective 3 is particularly relevant to the development at Manston.

4.3.5 The FRMS also indicate that new development should manage runoff in a sustainable manner, where possible using natural processes. Local plans and strategies should adopt policies that encourage new developments to use these techniques. Some planning authorities in Kent have developed specific policies and local guidance to encourage the use of SUDS that has proven to be very effective as it provides a clear picture to potential developers of what is required for all developments in the authority.

4.3.6 KCC will issue guidance for other risk management authorities, developers and other interested parties on how it will undertake the role of drainage approving body and how to apply for drainage approval once Defra has published details of how this role will be undertaken. In the meantime KCC will provide advice to any prospective developer about how to implement sustainable drainage.

4.3.7 KCC has developed a series of local SWMP plans. Manston falls entirely within the SWMP for Thanet (KCC, 2012) and lies largely within the Thanet Rural drainage area.

4.4 Sequential Test and Exception Test

Sequential Test

4.4.1 The NPPF describes the principles of the Sequential Test, which aims to steer new development to areas with the lowest probability of flooding. The Sequential Test is a decision-making tool designed to ensure that sites at little or no risk of flooding are developed in preference to areas at higher risk. As the whole site is located within Flood Zone 1 and all of the proposed development will be located within this flood zone, the Sequential Test is considered to have been passed. All new development will be in Flood Zone 1.

Exception Test

4.4.2 As the whole site is in Flood Zone 1, the exception test does not apply. The exception test requires that if, following application of the Sequential Test, it is not possible for the development to be located in zones with a lower probability of flooding it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk and a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

5. Flood Risk Appraisal

5.1 Introduction

5.1.1 This FRA considers the flood risks associated with the construction and operational phases of the proposed development. Both flood risks to and flood risks from the development are considered in this FRA. The FRA covers the 'Order Limits' which is the anticipated maximum extent of land in which the proposed development, including construction works, would take place. The entire Order limits are shown in Figure 2.1. This FRA uses a source-pathway-receptor led approach to the assessment of flood risk.

5.2 Summary of Potential Sources

5.2.1 The EA's flood map is shown on Figure 5.1. It can be seen that the site lies entirely in Flood Zone 1, and is therefore considered to be negligible risk of flooding from fluvial or tidal sources. Table 2.2 summarises the flood risk across the site from various potential sources of flooding - these are then discussed in the following sections.

Table 5.1 Summary of Potential Flood Risk Sources

Source of Flooding	Risk Posed	Notes
Fluvial	None	The whole site is located in Flood Zone 1 on the Environment Agency flood map. No watercourses are located within or adjacent to the site.
Tidal	None	There is no risk of tidal flooding to the site due to the distance to the coast and the elevation difference between the site and sea
Groundwater	Negligible	The elevation of the site and the great depth to the water table indicates that there is a very low risk of groundwater flooding.
Surface run-off/ run-on and surface water drainage	Low	With the exception of the B5020 Manston Road, the site is largely self-contained with very limited off-site upslope catchment. The site is located in an area of permeable soils which will not generate surface water runoff. However, Environment Agency flood maps for surface water, which are based on modelling of surface water flood risk indicates a potential risk of surface water flooding within the site. The proposed area of impermeable surfaces on site will increase as a result of the development. The site will have a modern, purpose-designed drainage system to manage flows leaving the site. Surface water drainage will be to the sea at Pegwell Bay and will not, therefore, affect downstream land. A drainage strategy is presented in Appendix A, which sets out how runoff will be managed and attenuated so as not to increase downstream flood risk
Sewer	Low	No surface water sewers are present on site. There are no records of sewer flooding at the site
Artificial / reservoirs	No risk	There are no artificial water bodies or flood defences that pose a risk of flooding to the site.

5.3 Historical Flooding

5.3.1 Records of historical flooding in the area are documented in the KCC SWMP Appendix C. Two of these incidents took place in the vicinity of Manston Airport, one at Manston Court Road in 2008 adjacent to the eastern boundary of the Northern Grass extending along Manston Road to the west (carriageway flooding due to heavy rain no property flooding), and one on Hengist Way on the southern boundary of the site (no details or a date is available).

5.3.2 Many of the historical incidents in KCC (2013) relate to:

- Blocked drains and / or surcharging of drains during and following heavy rain;
- Flooding of land adjacent to roads; and
- Coastal flooding due to tidal surges.

5.4 Fluvial Flooding

5.4.1 The EA's flood map (Figure 5.1) shows the site is in Flood Zone 1. The site is situated in on the flanks of a hill at an elevation of 50 mAOD, with the lowest edges of the site at approximately 40 mAOD. All known watercourses are below the level of the site. The site is not therefore considered to be at risk of fluvial flooding.

5.5 Groundwater Flooding

5.5.1 The Thanet SFRA (TDC, 2009) states that the District of Thanet is generally not an area with a high risk of groundwater flooding, despite the underlying chalk geology This is because ground elevations are generally high and the water table is at depth. This is particularly the case for the Manston Airport site, as it is located at the highest point in the district.

5.6 Surface Water Flooding

5.6.1 The Thanet SFRA provides an assessment of surface water flood risk across the Thanet borough. The SFRA contains mapping of areas potentially at risk (current in 2009).

5.6.2 The risk of surface water flooding is also shown on EA maps[2]. An extract of mapping of flood risk from all sources for the area covering the site is shown on Figure 5.2. This indicates a risk of surface water flooding by water generated within the site and along Manston Road based on the results of surface water modelling.

5.6.3 As the site is on a local topographical high point it has no upslope areas, so is effectively only at risk of water generated from within the site boundaries. The key issue is therefore the flood risk from surface water originating within the site, which will be managed via the site drainage.

5.6.4 The risk of flooding within the site must also be manged to ensure safe access and egress and to prevent interruption of operations. The drainage strategy has been designed to

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[2] https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

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manage surface water within the site to prevent flooding and maintain safe access and egress.

5.7 Sewer Flooding

5.7.1 The local SWMP (KCC, 2013) collated records of sewer flooding on the Isle of Thanet. None of the 25 incidents identified were within the site boundary or close to (within 2 km) to the Site.

5.8 Existing Flood Defence Structures

5.8.1 No existing flood defence structures have been identified within close proximity of the site.

6. Development of the Drainage Strategy

6.1 The Drainage Strategy

6.1.1 An outline drainage strategy for the site has been developed and is provided as Appendix A.

6.2 Planning Policy

6.2.1 National planning guidance, in the form of the Airports NPS, NPPF and PPG on flood risk and climate change, requires that surface water discharge from a development site should be such that the volumes and peak flow rates are no greater than the rates prior to the proposed development (unless specific off-site arrangements are made and result in the same net effect). It also suggests that, where possible, rainfall should be retained on site and allowed to infiltrate within the site. This usually means that run-off volumes will have to be stored during a storm and released slowly to meet the discharge rate requirement. However, in this case of a discharge to the coast, this restriction is unlikely to be applicable.

6.2.2 The NPS and NPPF further advise that planning authorities should promote the use of SUDS in the management of surface water run-off from new developments. Thus there is a presumption for the use of SUDS in development, unless it can be demonstrated that systems of this type are not feasible.

6.3 Floods and Water Management Act, 2010

6.3.1 Under the Floods and Water Management Act 2010, KCC are the lead local flood authority and a statutory consultee on drainage matters for planning applications. At detailed design stage, the drainage design will need to be submitted to KCC for approval.

6.3.2 The Floods and Water Management Act 2010 also recognises the roles played by district councils, internal drainage boards, highways authorities and water companies and these bodies, together with the EA, are identified as risk management authorities.

6.4 Consultation on the Drainage Strategy

6.4.1 The outline drainage strategy and FRA were developed following consultation with KCC and the EA. Evidence of the consultation process is provided in Appendix A.

6.4.2 The key factors from the consultation process that have influenced the outline drainage strategy and assessment of flood risk are:

- Delineation of separate catchments for the Northern Grass, main site and fuel farm;
- Avoidance of infiltration of water potentially containing pollutants to protect groundwater quality through the use of sealed drains and subsequent discharge to the sea;
- Incorporation of permeable paving in the Northern Grass area;
- Consideration of appropriate climate change factors.

6.5 Climate Change

6.5.1 Climate change is currently predicted[3] to increase the wetness of winters and the dryness of summers. The intensity of storm events is anticipated to increase over time to 5% by 2025, 10% by 2055, 20% by 2085 and 30% by 2115. The increased intensity will have an impact on the volume of rainfall that will fall at the site.

6.5.2 To account for climate change the drainage strategy incorporates a climate change allowance increase of 40% in the design calculations.

6.6 Selecting the Appropriate SUDS Strategy

6.6.1 The aim of SUDS is to ensure that surface water run-off is managed as close to its source as possible unless there are practical reasons for not doing so. The hierarchy of SUDS drainage options is set out in the NPPF PPG, and the aim should be to discharge surface runoff as high up this hierarchy as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

6.6.2 However, the Thanet FRA (2009) recognises that infiltration may not be compatible with groundwater protection in areas of high groundwater vulnerability and where the discharge has the potential to contain pollutants. Where infiltration is not possible, the SFRA states that preference should be given to discharge surface water into watercourses rather than into foul water drains. KCC also note in their SWMP for Thanet (KCC, 2012) that “To ensure protection from further deterioration of groundwater quality, there are likely to be restrictions on any proposed SUDs devices involving infiltration. The acceptability and construction details of infiltration devices is not only based on whether a site is in an SPZ but also depends on if the ground conditions are suitable (i.e. free from contamination) and if there is adequate unsaturated zone to offer attenuation of the discharge”.

6.7 Requirements of the Drainage System

6.7.1 The existing drainage arrangements at the site divert rainfall runoff falling on hard standing within the site to a sea outfall to Pegwell Bay. This outfall is of sufficient size to accept peak flows without surcharging. It is proposed to continue to use this arrangement.

6.7.2 The site lies within a source protection zone for a public water supply well. The public water supply is vulnerable to pollution from activities at the site because the geology is permeable at the surface. Both the EA and Southern Water wish to avoid infiltration to ground of potentially polluting substances and, therefore do not support the use of infiltration of surface drainage collected on hardstanding (runways, taxiways, aprons etc.).

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[3] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowance

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6.7.3 The outfall to Pegwell Bay consists of a large diameter pipe, which has a significant fall. This is unlikely to constrain the discharge flow rate. The main constraints on the rate at which water will be discharged are:

- The rate at which potentially contaminated water can be treated;
- The size of the pump that transfers water to the runway drain; and
- The capacity of the runway drain.

In addition, flows will be managed to avoid scour at the point of discharge to Pegwell Bay.

6.7.4 The outline drainage design is based on a peak pumping flow rate of 30 l/s. Using this value, attenuation ponds have been sized to provide sufficient storage to accommodate flood water up to a 1% AEP (or 1 in 100 year) plus 40% climate change effect rainfall event.

In order to achieve this flow restriction it is necessary to include attenuation in the system. In addition, the piped drainage system provided as part of the development will need to be designed to cope with the 100% AEP event (1 in 1 year storm event) without surcharging and to not result in flooding up to a 3.33% AEP (1 in 30 years) plus 40% climate change event and to not result in any off site flooding for rainfall events up to 1% AEP (1 in 100 year) plus 40% climate change event. The risk of surcharging has been assessed to establish if any overland flow routes could cause temporary surface water flooding. Where there is a risk that the system does surcharge in intense storm events, then site levels will be developed to contain flows within areas of impermeable cover and the drainage system. The Northern Grass and main sites will be connected by a pipe network.

6.7.5 The drainage strategy has taken into account the need to manage surface water at source and as the water is conveyed through the site as set out in The SUDS Manual (Ciria, 2015). The drainage strategy assessment has been made by considering the SUDS hierarchy and choosing suitable techniques in line with the main objectives of Quantity (Flood Reduction), Quality (Pollution Reduction) and Amenity/Biodiversity (Landscape and Wildlife Benefit).

Compatibility of SUDS with Site Conditions

6.7.6 A SUDS hierarchy approach has been used in the drainage strategy, as follows.

- Infiltration has not been considered due to the possible presence of pollutants in surface water and the vulnerable nature of the aquifer beneath the airport but maybe acceptable for clean water (e.g. roof drainage) in areas away from the adit for Lord of the Manor public water supply. Typically, SUDS techniques that promote infiltration of surface water are preferred over those which promote attenuation before discharge to a watercourse. The underlying solid geology (Chalk) typically has a high infiltration rate, making it suitable for infiltration. However, at Manston, much of the site lies within SPZ1 and SPZ2 where the use of infiltration that is potentially contaminated is discouraged by the Environment Agency. As a consequence, the draft drainage strategy has been developed to avoid infiltration.
- Discharge to open watercourses. Due to the permeable nature of the chalk geology in the Isle of Thanet, there are no permanent watercourses between the development site and the coast, which is located approximately 2 km south east of the site at its nearest point. As the existing surface water system within the site eventually discharges into Pegwell Bay, it is proposed that the drainage follows the existing system. As the discharge is to the sea, there is no flow restriction on discharge rates at the receptor. Nevertheless, the peak discharge rate from the development will be restricted to 30 l/s, as set out above. Attenuation is proposed for the development in order to (1) allow for treatment of potentially polluted water; and (2) to store rainfall in excess of pump capacity prior to it being pumped to the Pegwell Bay outfall.
- Discharge rainwater to a surface water sewer/drain. There are no surface water sewers within the vicinity of the site, so this option is ruled out.

- Discharge rainwater to the combined sewer. Given the nature of the development it is highly likely that the existing combined sewer network that serves Manston village will not have sufficient capacity, so this option is ruled out.

6.8 The Proposed SUDS Solution

6.8.1 The site has been divided into three drainage catchments: Northern Grass (50.3 ha), the main site (267.4 ha) and the fuel farm (2.0 ha) respectively (319.7 ha in total). Across the site there will be a total drained area of 131.3 ha; the remaining 188.4 ha of the site will remain as greenfield where rainwater will infiltrate to ground.

6.8.2 All surface water falling on impermeable surfaces will be collected. No infiltration of potentially contaminated surface water will be allowed, to avoid pollution of groundwater, as agreed with the EA, Southern Water and accepted by KCC;

- Surface water from the Northern Grass and main site will be collected in a drainage network and directed to SUDS treatment and attenuation ponds in the north of the site;
- In the Northern Grass area catchment, permeable paving underlain by an impermeable membrane will be used beneath roads, parking and footways to provide attenuation of drainage;
- Potentially contaminated water from the runway, taxiways and aprons will be treated at the ponds;
- There will be two ponds, one to accept potentially contaminated water for storage and treatment and one that accepts clean water e.g. from roof drainage;
- The discharge from the treatment pond will be to the clean pond;
- From the ponds, surface water will be pumped to the western end of the runway from where it will gravity drain within a pipe along the edge of the runway (eastwards) before entering an outfall that directs water to Pegwell Bay;
- The fuel farm will have a separate drainage system that directs water through oil-water separators before discharge to the Pegwell Bay outfall. The fuel farm drainage will also incorporate an anti-pollution non-return control valve;
- No surface water will be directed to sewer.

Attenuation Requirements

6.8.3 To manage the 1% AEP (1 in 100 year) plus 40% climate change event, surface water will be directed to attenuation ponds with a combined capacity of approximately 180,000 m^3. These have been sized based on the assumptions detailed in Appendix A.

6.8.4 In the drainage strategy discharge rates have been limited to 30 l/s. All attenuation storage calculations include a 40% allowance for climate change, as agreed with KCC (see Appendix A).

6.8.5 In the Northern Grass area treatment and additional attenuation storage will be provided by the use of permeable paving underlain by an impermeable barrier before drainage enters the attenuation ponds.

6.8.6 Calculations of run-off rates, proposed impermeable areas and attenuation requirements have been undertaken based on reasonable assumptions to determine the required SUDS assets (size, layout) in support of the DCO. Detailed drainage and SUDS design will be carried out subsequent to the granting of planning consent, and will be approved either via discharge of a condition of the consent, or as part of a discharge permit application. Detailed drainage design will need to be completed in future and agreed with the KCC and the EA.

6.8.7 Flows will be managed to avoid scour at the point of discharge to Pegwell Bay.

Treatment

6.8.8 Surface water collected from runways, taxiways and apron areas may be contaminated with hydrocarbons from refuelling / leaks and with de-icer (ethlylene glycol). It will therefore be treated prior to discharge.

6.8.9 Treatment is likely to consist of aeration within the attenuation pond and an oil-water separator. The treatment option and final water quality will be determined as part of detailed design. The final water quality will take into account the sensitivity of the receiving water (Pegwell Bay).

6.8.10 Permeable paving underlain by an impermeable membrane in the Northern Grass area will provide some attenuation of flow and treatment of pollutants prior to discharge to the attenuation ponds.

6.8.11 Water collected in the fuel farm will pass through an oil-water separator to remove hydrocarbons before discharge to the Pegwell Bay outfall. An anti-pollution control valve will also be incorporated to allow the discharge to be sealed in the event of a pollution incident.

Outfall Options

6.8.12 The proposed surface water outfalls from the attenuation ponds will consist of a pumped scheme to carry water into the sea outfall pipeline from where it will gravity drain to Pegwell Bay. The final layout of the ponds and details of the outlet flow control will need to be confirmed at detailed design stage.

7. Conclusions

7.1.1 The following conclusions can be drawn:

- The site lies in Flood Zone 1, which means that it is at low risk of fluvial or coastal flooding;
- The site is also at low risk of flooding from other sources (groundwater, reservoirs);
- The Sequential Test has been passed and the Exception Test does not need to be applied in the case of this development; and
- All potential risks of flooding to the ite have been assessed and mitigation and management options have been presented and incorporated into the outline design strategy.
- The outline drainage strategy is to collect all water falling on impermeable surfaces, pass it through attenuation or treatment ponds and then direct it to the sea at Pegwell Bay.
- Implementation of the drainage strategy will prevent flooding within the site or flooding of neighbouring land.

References

Department for Communities and Local Government. 2012. National Planning Policy Framework.

Department for Communities and Local Government. 2012. Technical Guidance to the National Planning Policy Framework

CIRIA, 2015. The SUDS Manual, C753

Kent County Council, 2011. Preliminary Flood Risk Assessment

Kent County Council, 2013. Thanet Stage 1 Surface Water Management Plan

Thanet District Council, 2009. Strategic Flood Risk Assessment

Thanet District Council (2017), Thanet District Council Local Plan Core Strategy [Accessed online on 09/11/2017 at https://www.thanet.gov.uk/your-services/planningpolicy/thanets-new-local-plan/what-is-the-new-local-plan/]

Appendix A
Drainage Strategy

631000 632000 633000 634000 635000

167000 166000 165000 164000

ACOL CP

Acol

THANET DISTRICT

MINSTER CP

Minster

Manston

Cliffs End

Isle of Thanet

Riding Centre

Aland Grange

Rose Farm

Pouces Cottages

Kent International Airport

B2190 SPITFIRE WAY

B2190

A299 HENGIST WAY

A299

A256

B2050 MANSTON ROAD

Industrial Estate

Police House

Hazeldene Farm

Durlock Farm

Cliffsend Point

St Augustine's Golf Course

Pegwell

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Key

- Application boundary
- Flood Zone 3
- Flood Zone 2
- Flood Zone 1

0 250 500 750 m

Scale at A3: 1:15,000

Client

RSP

Manston Airport DCO
PEIR
Floodl Risk Assessment

amec foster wheeler

Figure 5.1
Excerpt from flood map for planning for site location

December 2017 38199-Lon253.mxd parkj

file: H:\Projects\38199 LON Manston Airport DCO EIA\Drawings\ArcGIS\Figures\38199-Lon253.mxd

631000 632000 633000 634000 635000

167000 166000 165000 164000

ACOL CP

Acol

THANET DISTRICT

MINSTER CP

Minster

Isle of Thanet

Manston

Cliffs End

Kent International Airport

Riding Centre

Aland Grange

Rose Farm

Pouces Cottages

B2190 SPITFIRE WAY

B2190

A299 HENGIST WAY

A299

A256

B2050 MANSTON

Industrial Estate

Hazeldene Farm

Durlock Farm

Police House

Cheesemans Farm Industrial Estate

Cheesemans Farmhouse

Manston Court

Manston Green Farm

Solar Farm

Great Cliffsend Farm House

Cliffsend Point

St Augustine's Golf Course

Clapper Hill

Pegwell

Key

Application boundary

Chance of flooding in any year

- Greater than 3.3% chance
- Between 3.3% and 1% chance
- Between 1% and 0.1% chance
- Below 0.1% chance

0 250 500 750 m

Scale at A3: 1:15,000

Client

RSP

Manston Airport DCO
PEIR
Hydrogeological Risk Assessment

amec foster wheeler

Figure 5.2
Risk of flooding from multiple sources

December 2017 38199-Lon254.mxd parkj

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Appendix 9.1 - 9.5

Appendix 9.1

Archaeological Desk-based Assessment

Manston Airport, Kent

Archaeological Desk Based Assessment

August 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

RiverOak Strategic Partners

Main contributors

Jackie Pitt

Issued by

.....
Jackie Pitt

Approved by

Rachael Townend
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Amec Foster Wheeler

Doc Ref. LON039i1

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Document revisions

No.	Details	Date
1	Draft	12/09/2017
2	Revised draft	22/11/2017

Executive summary

Purpose of this report

RiverOak Strategic Partners is seeking a Development Consent Order (DCO) to secure the future of Manston Airport as a valuable regional and national asset by redeveloping the Manston Airport site as a freight airport.. Manston airport was an operational airport from 1916 until it closed in 2014. Much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal remain. This report has been produced for the purpose of assessing the historic environment at Manston Airport, Ramsgate, Kent ('the Site') in support of this proposal.

This report indicates that the Site lies within an area of high potential for significant archaeological finds and features from all periods. Initially part of the rural landscape, successive phases of aviation use throughout the 20th and 21st Centuries changed its character and influenced modern perceptions of the Site.

Contents

1. Introduction

1.1 The Document

This desk based assessment report has been prepared by Amec Foster Wheeler Environment and Infrastructure UK Limited (Amec Foster Wheeler) on behalf of RiverOak Strategic Partners ('the Developer') to determine the potential for encountering historic environment assets at the Manston Airport, Ramsgate, proposed development site ('the site').

This report details the known archaeological and historical baseline of the study area, which covers a radius of one kilometre from the site and includes significant sites beyond the 1km study area as identified in consultation with Kent County Council, to identify known heritage assets that have the potential to be affected by any proposed development. The baseline includes designated historic environment assets including scheduled monuments, listed buildings and protected landscapes, as well as known and potential archaeological deposits, historic landscapes and locally listed buildings.

1.2 Site context and proposed development

The site is centred on national grid reference 633343 165953, approximately 5km south of Margate and approximately 4km west of Ramsgate, within the district of Thanet in north-east Kent (Figure 1). The site is bounded by the A299 Hengist Way to the south and the B2190 Spitfire Way to the west, and is bisected by Manston Road (B2050) in the northern part of the site. The village of Manston lies 500m to the east and the village of Minster lies 1km to the south-west. The site covers an area of approximately 296 hectares (732 acres), comprising buildings and features associated with the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal, and two buildings housing the Spitfire and Hurricane Memorial Museum and the RAF Manston Museum. The buildings are clustered along the east and north-west boundaries of the site, with the 2748m long, 60m wide tarmacked runway, orientated in an east-west direction across the southern part of the site. The remainder of the site includes areas of hardstanding, large expanses of grassland, and some limited areas of scrub and/or landscaping.

The aims of the Proposed Development are to reopen and develop Manston Airport into a dedicated air freight facility, which also offers passenger, executive travel, and aircraft engineering services. There has been an operational airport at the site since 1916. Until 1998 it was operated by the Royal Air Force as RAF Manston, and for a period in the 1950s was also a base for the United States Air Force (USAF). From 1998 it was operated as a private commercial airport (known as Kent International Airport) with a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In the most recent years it operated as a specialist air freight and cargo hub servicing a range of operators, until it closed in May 2014.

2. Methodology

2.1 Aims and objectives

The purpose of this assessment is to:

- Review all recorded designated and non-designated heritage assets within an appropriate study area (one kilometre) and identify their value and sensitivity to change;
- Review significant sites beyond the 1km study area as identified in consultation with Kent County Council;
- Assess the potential for previously unrecorded archaeological remains within the site; and
- Establish the nature of considerations for setting.

2.2 Standards and guidance

All works undertaken or proposed as part of this assessment are compliant with the following standards and guidance:

- Chartered Institute for Archaeologists. 2014. Standard and Guidance for Historic Environment Desk-Based Assessments; and
- Chartered Institute for Archaeologists. 2014. Standard and Guidance for Commissioning Work or Providing Consultancy Advice on Archaeology and the Historic Environment.

2.3 Data gathering methodology

The following sources were consulted for the purpose of establishing the baseline:

- County-based registers of known or potential heritage assets;
- Cartographic and historic documents;
- Aerial photographs;
- Published sources;
- Internet sources; and
- Previous archaeological assessments and investigations of the area.

These were obtained from the following organisations:

- Kent County Council Historic Environment Record (HER);
- Kent County Council Historic Landscape Characterisation data (HLC);
- Historic England Archive (formerly National Monuments Record);
- Historic England National Heritage List for England spatial datasets;
- Historic England National Record of the Historic Environment (NRHE);
- Kent Archives and Local History Service;
- Kent County Council heritage maps;
- Thanet District Council conservation area mapping;

- Royal Air Force Museum, Hendon, London
- Spitfire and Hurricane Memorial Museum and RAF Manston Museum, Manston Airport
- documents submitted as part of the Stone Hill Park planning application (OL/TH/16/0550) including Appendix 10.1 Historic Environment;
- the zone of theoretical visibility and comparative light pollution levels produced for the PEIR report: Chapter 11: Landscape and Visual Impact;
- historic Ordnance Survey mapping provided by Envirocheck;
- Natural England historic environment mapping provided at Magic.gov.uk;
- The library of the Society of Antiquaries of London;
- British Geological Survey Mapping (http://www.bgs.ac.uk/geoindex/); and
- National Library of Scotland Map Library (NLSML).

Each heritage asset identified during the assessment is included within a Historic Environment Gazetteer (see Appendix B) and spatially mapped (Figures 2 and 3 (designated assets) and Figure 4 (non-designated assets).

2.4 Survey Work

Site walkover surveys were conducted on 7th and 8th of March 2017 to support the assessment. These surveys comprised a visual inspection of the current site infrastructure and land uses.

Archaeological trial trenching in support of planning application OL/TH/16/0550 was in progress during the site walkover survey. The results of this evaluation have not yet been released and will inform future examination.

Access has not been granted for further intrusive investigations or assessment of historic structures within the site. Discussion has been held with Historic England and Kent County Council as to whether or not intrusive investigations and historic building study will be needed to inform the assessment in the Environmental Statement. If required, the scope of any works will be agreed following consultation with Historic England and Kent County Council.

2.5 Consultation with authorities

Since 2016 initial consultations have been made with a range of consultees with an interest in potential historic environment resource effects, including Kent County Council Heritage Conservation Group, The Trust for Thanet Archaeology, Planning Inspectorate (PINS), Historic England, and Thanet District Council to identify the considerations necessary to create a robust Heritage Mitigation Framework.

2.6 Limitations and assumptions

HER data was collected on 3rd November 2016. The HER is continually updated as further data regarding the historic environment becomes available; for example, when the results of recent archaeological investigations are made available. As the HER is a record only of known features, it is not a reliable predictive tool, but can provide useful information that can be used with other information to develop an understanding of the potential presence, nature and significance of archaeological remains.

An attempt has been made to consult all readily available documentary sources. However, it is always possible that there are additional documentary sources which have not been identified; for example, those held under obscure references.

3. Legislation and policy review

Certain heritage assets that are deemed to be of particular importance are given legal protection. The importance of heritage assets and the protection of these assets and their settings is recognised in legislation as well as in national, regional and local policy.

3.1 European conventions and national legislation

European conventions relating to archaeological heritage include the 1985 Granada Convention for the Protection of Architectural Heritage, the 1992 Valetta Convention on the Protection of Archaeological Heritage, as well as the European Landscape Convention. The latter has been in force in the UK since 2007, promotes the protection of landscapes, and recognises the role of landscape as a component of cultural heritage.

The Ancient Monuments and Archaeological Areas Act 1979 (AMAAA)

The AMAAA provides for a schedule of monuments which are protected and sets out measures for their safeguarding and management. Heritage assets which appear on the schedule are known as scheduled monuments. Scheduled monuments may include any above or below ground building, structure or work which fulfils the criteria for scheduling set out by the Secretary of State for Culture, Media and Sport. Scheduled monument protection is offered not only to the known structures and remains of a site but also to the soil under and around them in order to protect any archaeological interest.

The Planning (Listed Buildings and Conservation Areas) Act 1990 (P(LBCA)A)

This legislation provides for the definition and protection of a list of buildings of special architectural or historical interest, known as listed buildings. This legislation also sets out the requirement to have special regard to the desirability of preserving a listed building, its setting and any features of architectural and historical interest in considering any proposed development (Section 66). The P(LBCA)A also provides for local planning authorities to maintain lists of areas of special architectural or historic interest, referred to as conservation areas. This act requires local planning authorities or decision makers to have paid special attention to the desirability of preserving or enhancing the character or appearance of the conservation area (Section 72).

The Infrastructure Planning (Decisions) Regulations 2010

Under P(LBCA)A, areas of special architectural or historic interest can be designated as conservation areas, the character or appearance of which it is desirable to preserve or enhance. The act requires decision-makers to have regard for the desirability of preserving the character and appearance of conservation areas.

The Hedgerow Regulations 1997

This legislation sets out criteria for identifying important hedgerows and for a process of gaining consent for their removal. These criteria include a number of heritage-based considerations. Removal of an important hedgerow is deemed as permitted where a planning permission or DCO which would require removal of a hedgerow has been granted as detailed in The Infrastructure Planning (Miscellaneous Prescribed Provisions) Regulations 2015.

Protection of Military Remains Act 1986

Under this Act it is an offence to tamper with, damage, move, or unearth any remains of military aircraft and vessels that have crashed, sunk or been stranded and of associated human remains without a licence from the Ministry of Defence.

3.2 National policy

The National Planning Policy Framework 2012 (NPPF) sets out guidance for local planning authorities and developers with respect to the determination of planning applications in England. Of relevance to the Historic Environment is Section 12: *Conserving and Enhancing the Historic Environment*. National Planning Policy Guidance for the Historic Environment is also of relevance (https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment).

Further guidance on the Historic Environment has also been provided by Historic England who have produced advice through the publication of three Good Practice and Advice guides (GPAs) 1-3. These give focused advice on making informed planning decisions in regards to heritage-related planning applications. The Chartered Institute for Archaeologists (CIfA) has produced standards and guidance documents for the production of desk-based assessments and providing consultancy advice in the historic environment. It should be noted that whilst these provide good practical guides to the management of the historic environment resource, they do not form part of national policy.

Key aspects of policies relevant to this appraisal are set out in Table 3.1.

Table 3.1 National policies

Policy Document	Policy Reference	Summary
Ancient Monuments and Archaeological Areas Act (1979)		Changes to the fabric of scheduled monuments require consent from the Secretary of State, as advised by Historic England.
Planning (Listed Buildings and Conservation Areas) Act (1990)		Covers the registration of Listed Buildings (buildings that are seen to be of special architectural or historic interest) and designation of Conservation Areas (areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance).
Protection of Military Remains Act (1986)		Changes which will damage, move, or unearth any remains of military aircraft and vessels that have crashed, sunk or been stranded and of associated human remains require a licence from the Ministry of Defence.
National Planning Policy	Draft Airports National Policy Statement	The government issued the Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England in February 2017. Whilst this document focuses on the potential for an expanded Heathrow Airport it provides policy guidance as to how the impacts of airport development upon the historic environment should be considered. The Draft NPS is consistent with the NPPF, but emphasises the specific impacts that come from airport development. Paragraph 5.184 of the Draft NPS makes reference to noise impacts and how these affect the understanding and appreciation of heritage assets affected by the scheme. This paragraph refers to a methodology produced for Historic England detailed in Aviation Noise Metric – Research on the Potential Noise Impacts on the Historic Environment by Proposals for Airport Expansion in England (September 2014). This document provides a methodology for assessing noise impacts based upon plotting the area around an airport that would be exposed to a 60db noise, this is a level that interrupts normal speech. The assessment is based upon the sensitivity of heritage assets to noise. There are four suggested classes of asset where silence or reduced noise contributes to their significance are: Where solitude is intrinsic to the understanding of the form, for example a Cistercian Monastery or hermitage; Where specific, existing soundscapes contribute to the asset, for example working windmills, open air theatres, or cascades; Where abandonment of the asset creates a romantic atmosphere that silence contributes to, for example deserted medieval villages or ruinous houses; and Where the absence of modern sound contributes to the experience of an asset at a particular point in time, for example the abandonment of a monastic house. Effectively these four classes of asset are two classes, one where specific noises need to be heard to appreciate significance, and one where silence contributes to significance. Other types of asset, for example, an urban conservation area, silence or specific sounds, contribute less to their significance and could be scoped out. Once assets of the four types have been identified noise assessments would need to be

Policy Document	Policy Reference	Summary
		made concerning the impact from the changing level of noise. A quantitative assessment would be made considering: How disturbing the noise is; How much new noise interferes with existing noise; and How often the disturbance occurs. This then enables a level of harm to be assessed against the significance of the heritage asset and assessed against the policy tests of the NPPF. As this methodology is detailed in a national policy document it would be applied to heritage assets within the 60db contour around Manston.
		The NPPF does not set out the policy for the testing of Nationally Significant Infrastructure Projects (NSIPs). However, Section 12 relates to the Historic Environment and is consistent with the draft policies of the Draft Airports NPS. A positive strategy should be implemented for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats. Heritage assets should be conserved in a manner appropriate to their significance. Local authorities will require applicants to describe the significance of heritage assets including the contribution made by their setting affected by the application.
National Planning Policy Framework (2012)	Paragraph 128	When considering the impact of a proposal on a designated heritage asset great weight should be given to the asset's conservation. The more significant the asset the greater the weight should be. Significance can be harmed or lost through alteration to the asset or development in its setting.
	Paragraph 132	Where development will lead to less than substantial harm to the significance of the designated asset the harm should be weighed against the public benefit of the proposal.
	Paragraph 134	The effect of a proposal on the significance of a non-designated heritage asset should be taken into account in determining the application.
	Paragraph 135	Non designated archaeological heritage assets of demonstrably equivalent in significance to scheduled monuments should be managed as designated heritage assets.
	Paragraph 139	Non designated archaeological heritage assets of demonstrably equivalent in significance to scheduled monuments should be managed as designated heritage assets.

3.3 Regional and local policy

The site is located within the district of the Isle of Thanet, in north-east of the county of Kent. The planning policies pertinent to the site are the adopted local plan, Thanet District Adopted Local Plan (2008), and the emerging local plan policies, Draft Thanet Local Plan to 2031 (Preferred Options Consultation January 2015). The key policies relevant to the historic environment are set out in Table 3.2 below.

Table 3.2 Local policies

Policy Document	Policy Topic	Policy Reference	Summary
Local Policies	Thanet District Adopted Local Plan (2008) saved policies	Policy HE11	To determine planning applications the District may require the provision of an archaeological assessment which, in certain cases, may involve fieldwork.

Policy Document	Policy Topic	Policy Reference	Summary
		Policy HE12	Archaeological sites will be preserved and protected. Where sites do not merit preservation planning permission will be granted subject to a suitable programme of archaeological recording.
Emerging Local Policies	Draft Thanet Local Plan to 2031 Preferred Options Consultation January 2015	Policy HE01	The Council will promote the identification, recording, protection and enhancement of archaeology and historic sites and encourage their potential though management and interpretation. Developers should submit suitable information to enable the impact of proposals to be assessed in the form of a desk-based assessment or field evaluation. Development adversely affecting the setting of a scheduled monument or equivalent archaeology of comparable significance will be refused. Where the Council is not seeking to preserve a site a suitable programme of recording will be required according to a written scheme of investigation detailing site works, post-excavation works and publication.
		Policy HE03	The Council supports the retention of local heritage assets that will be identified in the local list as part of the heritage strategy.
		Policy HE04	Permission will not be granted for any development that adversely affects the visual, historical or horticultural character of an historic park or garden whether or not it is on the statutory register.
		Policy HE05	Works to address climate change by adapting heritage assets will be supported where the significance of the asset is not compromised.

4. Baseline

4.1 Site location and topography

The site is located south of Margate and west of Ramsgate, within the district of Thanet in north-east Kent. It is bounded by the A299 Hengist Way to the south and the B2190 Spitfire Way to the north-west, and is bisected by the B2050 Manston Road in the northern part of the site. Areas of farmland border the east and west. The villages of Manston, Minster and Cliff's End lie 500m to the east, 1km to the south-west and 800m to the south-east respectively. The site covers an area of approximately 296 hectares (732 acres), comprising buildings and features associated with the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal, and two buildings housing the Spitfire and Hurricane Memorial Museum and RAF Manston Museum. The buildings are clustered along the east and north-west boundaries of the site, with the 2748m long, 60m wide tarmacked runway, orientated in an east-west direction across the southern part of the site. The remainder of the site includes areas of hardstanding, large expanses of grassland, and some limited areas of scrub and/or landscaping.

The Proposed Development site is mainly situated at an elevation between 40-55m AOD. The southern portion is located at an elevation of approximately 50m AOD, along the length of the existing runway, but rises to approximately 55m AOD in the western most corner of the site. North of the runway the site level falls to approximately 40m AOD, in the west, at the Spitfire Way Junction (crossroads of the Manston Road (B2050) and the Spitfire Way (B2190)), while remaining at 45-50m AOD in the northern most part of the site. Telegraph Hill, at the west end of the site, is a high point in the surrounding landscape, while the existing runway is roughly sited along the length of a ridge running east from Telegraph Hill.

4.2 Geology

The site is underlain by bedrock Margate Chalk Member of the upper Newhaven Chalk Formation, overlain by the sands and silts of the Thanet Formation along the site's northern boundary. The superficial drift deposits overlying the site are variable, with some areas having no superficial geology (predominately in the south of the site) interspersed with areas of Head Formation, comprising Clay and Silt.

4.3 Historic landscape character

The site is part of Kent Historic Landscape Character Area 18: Isle of Thanet. Unsurprisingly, most of the site lies within an historic landscape character area defined as 20th century airfields. This represents the dominant historic land-use of the site itself for over a century, with extant features, including the airfield runway, hangers, towers and pillboxes reflecting both its military past and recent commercial aviation history. The east and west areas of the site are characterised as irregular fields bounded by roads, tracks and paths. The majority of the area in close proximity (1km) to the site is also predominantly irregular fields bounded by roads, tracks and paths, interspersed with post-1800 scattered settlements with paddocks, and post-1810 settlements. An area of industrial complexes is adjacent to the site at the northwest, with a caravan site in close proximity to the northeast and a reservoir and water treatment area to the south. It is thought that these relatively recent historic landscape character types may overlay an historic landscape character of irregular fields bounded by roads, tracks and paths, possibly relating to post-medieval informal enclosures. This is discernible in the post medieval field and boundary system visible in aerial photographs which still reflects that of historic maps. The mudflats of Pegwell Bay are within 2km of the south-east of the site.

Overall, the site lies within an area of local and regional historic significance due to its location on the Isle of Thanet. Until approximately 1000 years ago, this area of north-east Kent was an island separated from the mainland by the Wantsum Channel until it silted up in the 16th century, creating a unique landscape, with its development and activities governed by its geographical position.

4.4 Designated heritage assets

There are no designated heritage assets on the site, although there are some designated heritage assets within the study area as detailed below. A gazetteer of designated heritage assets is provided as Appendix B, these are shown on Figure 2.

World Heritage Sites

There are no World Heritage Sites (WHS) within the study area. The nearest WHS, Canterbury Cathedral, St Augustine's Abbey and St Martin's Church in Canterbury, is located 16km southeast of the 1km study area.

Scheduled monuments

There are two Scheduled Monuments (SM) within the 1km study area which are both within close proximity to the site:

The nearest scheduled monument to the site is the Anglo-Saxon Cemetery south of Ozengell Grange (List Entry 1004228), which is located 100m to the east of the site. Partial excavation since the mid-19th century has recorded over 100 Anglo-Saxon burials, many with grave goods, on or in the vicinity of the site. Further archaeological remains survive in the vicinity of this site but are not included because they have not been formally assessed (i.e. partial excavation near Ozengell Grange, to the north of the monument, has recorded several hundred Anglo-Saxon burials, which are likely to be part of the same inhumation cemetery); and

Enclosure and ring ditches sited 180m east-northeast of Minster Laundry (List Entry 1004203) and located directly south of the A299 which forms the southern boundary of the site. The features recorded as crop marks on aerial photographs represent the surviving ditches of a Romano-British and Iron Age settlement.

Listed buildings

There are no listed buildings within the site, however there are 24 listed buildings surrounding the site within the 1km study area. The nearest listed building is the Grade II Remains of Monastic building (List ENTRY 1085443), situated 35m to the east. These assets are detailed in Table 4.1 below.

Table 4.1 Listed buildings within the study area

Listing ID	Name	Grade	Distance from site
1224593	Wayborough Manor	II*	570m to south
1224683	Cleve Court and Cleave Lodge	II*	220m to north west
1336669	Barn about 50m east of Ozengell Grange	II*	430m to north east
1085377	Ozengell Grange	II	400m to north east
1085409	53 and 55 Foad's Lane	II	820m to south
1085442	Grove Farmhouse and Walled Front Garden	II	500m to east
1085443	Remains of Monastic Building	II	35m to east
1085444	Barn at Preston Farm	II	680m to east
1085445	Barn at Manston Green	II	450m to east
1204244	Flete Lodge	II	580m to north east
1223803	Cheeseman's Farm	II	760m to north
1224336	Chapel House	II	480m to south

Listing ID	Name	Grade	Distance from site
1224337	Psalm Cottage	II	920m to south west
1224339	Rose Cottage and Pansy Cottage	II	675m to south
1224448	Prospect Inn	II	150m to west
1224499	Bay Tree Cottage	II	950m to south west
1224545	Tudor Cottage	II	660m to south
1266885	Rose Cottage	II	920m to south west
1266887	Way House and Wayborough House, and attached Garden Wall	II	350m to south
1336624	Old Forge House	II	480m to east
1336625	Manston Court and adjacent Wall	II	60m to east
1336626	Granary about 25m south of Manston Court Farmhouse	II	50m to east
1429581	Eastern of two Concrete WWII 4-inch gun emplacements	II	950m to south east
1430779	Manston War Memorial	II	445m to east

Designated assets outside the study area

As agreed with Kent County Council, the significant heritage assets Monastic grange and pre-Conquest nunnery at Minster Abbey (List Entry 1016850) and Saxon Shore fort, Roman port and associated remains at Richborough (List Entry 1014642), which lie outside of the approved study area, are included in this assessment (Figure 3).

The scheduled monument Monastic grange and pre-Conquest nunnery at Minster Abbey (List Entry 1016850) is located c. 1.3km to the south of the eastern of the site. Situated on low-lying ground near the eastern edge of the town of Minster, the nunnery, built in AD 741, is represented by below ground traces of buildings and associated remains, which survive beneath the later monastic grange. Built in the 12th Century by Benedictine monks, the grange served as the main administrative centre for their farmlands. The grange survives in the form of standing buildings, water-filled fishponds and associated below ground remains. The main grange buildings were arranged around a square, east-west aligned courtyard. The standing buildings (List entry 1223807) are Listed Grade I and incorporate the northern hall range and attached western range, along with the ruined fragment of a square tower which adjoins the southern end of the western range. It was subsequently altered in the 15th, 17th, 19th and 20th centuries.

The Saxon Shore fort, Roman port and associated remains at Richborough (list entry 1014642) is located c. 5km to the south of the site. The monument includes an area of c.40ha containing a variety of archaeological components dating from the Iron Age, Roman and medieval periods, situated on a low sandy promontory around 2.5km from the present coastline of eastern Kent. The earliest known use is an Early Iron Age Farmstead, which was followed by the landing of part of the Roman invasion force here in AD 43 and subsequent temporary camp. This became a Roman military and naval supply base, and then a Roman port and associated settlement which was fortified in the third century. Within the area of the Saxon Shore fort scheduled monument lies the Grade I Richborough Castle (List entry 1363256). It contains the remains of the Roman settlement of *Rutupiae,* and the three sides of the late third Century Saxon shore fort, with additional areas dating to the 10th and 12th centuries.

Conservation Areas

There are no conservation areas within the 1km study area, however the conservation areas of Acol and Minster in Thanet are both situated c. 1km to the north-west and south-west respectively. The conservation

areas of St. Nicholas at Wade, c. 5km to the west; Ramsgate, c. 3.5 km to the east; and Broadstairs, c. 5km east-north-east of the site are likely to be under the flight path (Figure 3).

Registered Parks and Gardens

There are no Registered Parks and Gardens (RPG) within a 1km radius around the site. The nearest RPG is grade II* registered Goodnestone Park which is 11km beyond the 1km study area.

Registered Battlefields

There are no Registered Battlefields in Kent.

4.5 Non-designated heritage assets

There are over 800 previously identified non-designated heritage assets within the site and the 1km study area, including archaeological remains from the prehistoric through to modern times; the latter including various phases of use of the airport. These, in addition to its situation within an archaeologically sensitive area due to its geographic location, indicates long term human activity within the area ranging from the prehistoric period to the present day.

Non-designated heritage assets are mapped in Figure 4 (Appendix A: Figures), tabulated in Appendix B and described within the site chronology below.

4.6 Site chronology

Early prehistory: Palaeolithic and Mesolithic hunter gatherers

Internationally significant sites with evidence for some of the earliest human occupation in the UK have been found in the county of Kent along the banks of the River Thames. The county is recognised for significant and nationally rare finds relating to the early prehistoric era in Britain. Early human activity during the Palaeolithic period (c. 700,000 to 10,000 years BP) consisted of the transient and intermittent movements of hunter-gatherers through the local landscape (e.g. in order to follow herds of animals, fish or collect useful and/or edible plants) which tends to leave only ephemeral traces of activity or isolated findspots of artefacts in the landscape. Most commonly found are lithic artefacts, including handaxes and various flake and blade flint tools, although bone and antler artefacts begin to appear during the Upper Palaeolithic.

The Mesolithic period (roughly 10,000 to 5,500 BP) saw a transition towards the use of seasonal or permanent occupation sites. While many continued the hunter-gatherer lifestyle, initial stages of domestication have been observed. Lithic technology is dominated by microliths during this period.

The Stour Basin characterisation project (Mason, S., pers comm) identifies the site as within two specific areas. The runway and majority of the operational buildings are characterised as of very low potential as a result of potential denudation of superficial deposits in the later parts of the Last Glacial and during any subsequent Holocene slopewash activity. Areas to either side of Spitfire Way and around the village of Manston are characterised as of moderate potential owing to the possible presence of loessic deposits which were not denuded during Holocene slopewash, This is supported by artefactual evidence which indicates potential transient occupation in the area during this period.

Residual evidence on the site includes a Palaeolithic flake recovered from a later feature on the southern boundary during excavations on the East Kent Access road carried out by a joint venture between Oxford Archaeology and Wessex Archaeology in 2009-2011 (TR 36 NW 546); and a Lower to Middle Palaeolithic pointed implement recovered as a surface find in 1899 from the Telegraph Hill area of the site (TR 36 NW 55). Within the study area c. 0.7km to the north-west of the site, a Middle Palaeolithic lithic working site, comprising 18 flakes, a blade core, two scrapers and a small cordate handaxe of Mousterian appearance, identified during an evaluation in 2003 by Canterbury Archaeological Trust (TR 36 NW 489), is thought to be fairly in situ. A Lower to Middle Palaeolithic handaxe was excavated by Wessex Archaeology in 2006 c. 1km north-east of the site (TR 36 NE 2403).

There are no Mesolithic finds from the site, but a tranchet axe was recovered from a tree throw during the East Kent Access Route excavations in 2009-2011 (TR 36 SW 366) c. 600m to the south of the site. Archaeology South East's 2007-8 excavation c. 1km to the east of the site identified Mesolithic flakes, blades and bladelets from later features (TR 36 NE 577).

Later prehistory: Neolithic, Bronze Age and Iron Age settled farmers

The Neolithic period was generally characterised by the spread of farming of crops and domestication of animals, accompanied by increasing forest clearance and the establishment of permanent settlements. These local population centres often increased and expanded during the Bronze and Iron Ages, while the local landscape was transformed by the construction of field boundaries enclosing areas of pasture and farmland and the erection of highly visible symbolic structures such as monuments to the dead (e.g. bronze age round barrows).

No Neolithic artefacts have been recovered from the site but there is good evidence of Neolithic activity in close proximity. In the eastern part of the study area a Neolithic settlement, containing linear features and pits with pottery was found c. 900m from the site during an evaluation in 2003 by the Trust for Thanet archaeology at the Preston Park Caravan Site (TR 36 NE 598). Neolithic pits containing both Neolithic pot sherds and flints were identified during the 2009-2011 East Kent Access Road excavations at two locations c. 500m (TR 36 SE 737) and c. 600m (TR 36 SE 737) from the site, and during a pipeline excavation by Wessex Archaeology in 1995 c. 1km to the south east of the site at Chalk Hill (TR 36 SE 319). A shallow feature at a Tesco development c. 750m from the site revealed an early Neolithic bowl during excavation in 2009 by Wessex Archaeology, while two ex-situ flint scatters are noted at distances of c. 100m (TR 36 NE 634) and c. 900m (TR 36 NE 578). In the western part of the study area, a Neolithic pit containing pot sherds was found during the 2004 evaluation by Canterbury (TR 36 NW 482) c. 100m to the south-west. An ex-situ Mesolithic or Neolithic flint scatter (TR 36 NW 504), c. 70m north of the site boundary lies c. 400m south of features identified on aerial photography as a potential Neolithic long barrow (TR 36 NW 243). Just outside the study area, immediately north of Chalk Hill in Pegwell Bay, the remains of a Neolithic causewayed enclosure (TR 36 SE 24) measures about 150 metres in diameter and consists of three concentric circuits of interrupted ditches,

Bronze and Iron Age activity from the study area is widespread. Within the site, a Middle to Late Bronze Age ditch, containing pottery and human remains was found during an evaluation on the cargo side of the airport in 2000 by the Trust for Thanet Archaeology (TR 36 NW 466). On the southern border of the Site, an assemblage of Bronze artefacts found during the construction of a pipeline in 1984 (TR 36 NW 193) is thought to have been associated with a hoard, possibly disturbed by ploughing. A round barrow of probable Early Bronze Age date at the east end of the runway was examined in 1944 after being largely destroyed (TR 36 NW 34). It contained a primary and secondary burial. The ploughed remains of a further probable round barrow c. 900m further east was excavated in 1985 (TR 36 NE 54). Telegraph Hill in the western area of the site marks a high point in the landscape, with an enclosure and round barrow recorded as cropmarks (TR 36 NW 210), and may be a focus for these funerary features. In the northeast corner of the site, Bronze Age flint tools were recovered in later features during a 2005 evaluation by Museum of London prior to the construction of the EDF Substation (TR 36 NW 487).

Iron Age activity on the site is represented by a pit containing Iron Age pottery sherds excavated by the Trust for Thanet Archaeology during an evaluation on Laundry Road in 1995 (TR 36 NW 382), who also uncovered a scatter of Early Iron Age pottery recovered during evaluation works on the passenger side of the airport (TR 36 NW 469). A further concentration of pits was noted in the 1960s to lie under the east end of the runway (TR 36 NW 35). Finally, an extensive late Iron Age and early Roman settlement was revealed during evaluation works in advance of the construction of a new car park at the Airport (TR 36 NW 1176), with features containing a rare types of buildings and a pottery kiln, reflecting adaptation of Iron Age peoples to Roman influences.

The wider study area contains over two hundred Historic Environment Records dating to the later prehistoric period, including a Bronze Age settlement on the Tesco site at Manston Road, excavated by Wessex Archaeology in 1996 (TR 36 NE 484; TR 36 NE 471); a Late Bronze to Early Iron Age settlement uncovered by the Trust for Thanet Archaeology in 1987 during excavations in advance of a pipeline (TR 36 NW 226); and a Middle to Late Iron Age settlement with inhumation burials, revealed by Canterbury Archaeological Trust in a 2004 evaluation at Tothill Street (TR 36 NW 484). The East Kent Access Route excavations

(2009-2011) also identified a Bronze Age agricultural settlement with four inhumation burials (TR 36 SW 374) and a Middle to Late Iron Age settlement (TR 36 SW 376), in addition to many other later prehistoric features along the route, which lies just to the south of the extant runway. The Scheduled Ancient Monument of Enclosure and ring ditches 200yds (180m) ENE of Minster Laundry (1004203) is situated c. 100m to the south of the western end of the runway on the site, with undisturbed Iron Age features identified as cropmarks on aerial photographs. The intensification of settlement and agricultural land use during this period emphasises the growing importance of the Wantsum Channel.

Roman

The Roman occupation of Britain had a significant impact on north-east Kent and evidence of Roman activity is widespread in the study area. Recent evidence from Ebbsfleet has been interpreted as the landing point for Julius Caesar's 54BC arrival in Britain. The strategic geographic location of the area, formed by the Wantsum Channel, created an easily defensible gateway. The Roman period is characterised by dense settlement patterns and proliferation of Roman structures throughout the south east comprising several roads, Roman forts and settlements, including the important sites at Richborough, c. 5km to the south of the site. Located at the south-eastern end of the Wantsum Channel, it was here that part of the subsequent Roman invasion force, under Senator Aulus Plautius landed in 43AD. The temporary camp initially constructed at this location developed into the Roman port, Rutupiae, c. 90AD. This was replaced in c. 270AD by one of several Saxon Shore forts in the region (List entry 1014642 and 1363256), which were fortifications built to protect against invading Saxon raiders. A similar Saxon Shore fort is located at Reculver (List entry 1018784), at the north-western end of the Wantsum Channel, c. 8km north west of the site.

Roman activity is known from the site itself. An extensive Romano-British industrial and settlement site was found during the construction of a gas pipeline in 1984 along the southern edge of the Airport site (TR 36 NW 182). Features below the floor of the trench remain intact. Further evidence for Romano-British occupation and industrial activities were found during westward expansion of the runway during WWII (TR 36 NW 209), and a Roman pit with a hearth in the base was found during excavations on the cargo side of the airport in 2000 by the Trust for Thanet Archaeology (TR 36 NW 467). The East Kent Access Route excavations in 2009-2011 identified several Roman ditches, gullies, pits and cremations (TR 36 SW 405), while an antiquarian discovery of a Roman coin hoard in c. 1630 is reported near the site of the windmill on Telegraph Hill (TR 315 657), which is detailed on historic maps.

Evidence of Roman activity is also widespread throughout the study area in the form of finds of pottery, coins, brooches and other objects, in addition to several settlements, field systems, road, cemetery sites, buildings and quarries. The sites include two cemeteries, containing inhumation and cremation burials found associated with other Romano-British features during the Margate to Weatherlees Hill Wastewater Treatment Works Twin Pipeline excavation by Wessex Archaeology in 2005 (TR 36 SW 123); a settlement comprising 22 rare sunken feature buildings and other domestic features identified during a road widening scheme in 1994 (TR 36 NW 238); a cemetery containing four cremations and five inhumations (TR 36 NW 187), a ditch (TR 36 NW 188), and road surface with pottery scatter (TR 36 NW 184) found during the construction of the Monkton Gas Pipeline in 1984, situated along the length within and just to the south of the site which may indicate a Roman Road following the modern route of the A299; a primitive farming villa with outbuildings dating to the second half of the first century AD found during rescue excavations at the Nethercourt estate in the 1980s (TR 36 NE 177); an inhumation burial from the 1995 pipeline investigation at Cliffsend (TR 36 SE 320); and three early-Roman cremation burials from a 2015 evaluation on Manston Road (TR 36 NW 1191). The Scheduled Ancient Monument of Enclosure and ring ditches 200yds (180m) ENE of Minster Laundry (List Entry 1004203) is situated c. 100m to the south of the western end of the runway on the site, with an undisturbed Romano-British farmstead identified as cropmarks on aerial photographs.

Early medieval

Even before the fifth century, groups of Saxons, Jutes and Angles from the European mainland were already moving into prime agricultural areas in southern England. Saxon Shore forts were built at Richborough and Reculver, at either end of the Wantsum Channel, to defend against invasion.

Findspots of Anglo-Saxon artefacts on the site include an early-medieval bead and iron knife on the southern border (TR 36 NW 216), and a silver early penny ('sceat') (TR 36 NW 498), a Merovingian gold tremissis (TR

36 NW 499), and pottery (TR 36 NW 471) from the passenger area of the airport. At the western end of the site, a small barrow and linear features visible as cropmarks have been identified as Anglo-Saxon as a result of Anglo-Saxon finds made in close proximity (TR 36 NW 214).

Within the study area, the Scheduled Monument of Ozengell Grange Anglo-Saxon inhumation cemetery (1004228) is located c. 150m south-east of the site. Discovered during the construction of the railway line in the mid-19th century, partial excavations carried out in 1845-50, 1977 and 1980-82 revealed over 100 Anglo-Saxon burials, many with grave goods. It has not been completely excavated.

Over fifty Historic Environment Records in the study area include a small Anglo-Saxon cemetery and boundary ditch uncovered during a road widening scheme (TR 36 NW 240); high status burials covered by a wooden structure, possibly a boat, identified during an evaluation near the A253 (TR 36 NW 186); a cemetery and possible feasting site found during excavation in advance of new housing at Cliffs End Farm (TR 36 SW 229); and a settlement containing multiple sunken feature buildings with evidence for segregated activity at Manston Road, prior to construction of a new Tesco (TR 36 NE 485), while the East Kent Access Route excavations (2009-2011) revealed buildings (TR 36 SW 371; TR 36 SW 371), trackways (TR 36 NW 1145; TR 36 NW 1159), and cemeteries (TR 36 SE 739; TR 36 NW 1144; TR 36 NW 1143; TR 36 NW 1160) along the route just to the south of the site. These, in addition to buildings (TR 36 NE 455; TR 36 NW 455; TR 36 NW 474), burials (TR 36 NW 383; TR 36 NE 26; TR 36 NW 189; TR 36 NW 195; TR 36 SE 686); barrow and/or ring ditch crop marks (TR 36 NE 87; TR 36 NW 123; TR 36 NW 172; TR 36 NW 178; TR 36 NW 179; TR 36 NW 214; TR 36 NW 214; TR 36 SE 23); a midden (TR 36 SE 716), and findspots of coins and jewellery found throughout the study area, indicate sustained and continued Anglo-Saxon activity in the region.

Medieval

The first specific documentary evidence for settlement in the vicinity of the site comes from the medieval period with a large settlement noted at Minster in the Domesday survey of 1086, owned by the monks of St Augustine of Canterbury. Settlement at Manston likely dates from the 12th century (VCH, Kent, Vol 2), with the lord of the Manor of Manston holding important office during the reign of King John (The History and Topographical Survey of the County of Kent: Volume 10). Medieval trackways are visible on both historic mapping, shown as Dunstrete, and on a geophysical survey of the site recently completed in support of the planning application OL/TH/16/0550. Dunstrete was an important east-west aligned routeway across Thanet, a portion of which runs through the southern part of the site.

Medieval finds from the site include pottery, a medieval copper alloy buckle and features including ditches and pits indicating medieval occupation of the site (TR 36 NW 471; MKE80179; TR 36 NW 468).

Within the wider study area, Medieval occupation is represented by the presence of farmsteads (TR 36 NE 227; TR 36 NW 246; TR 36 NW 254), the remains of the manor of Upper Court (TR 36 NE 28), a settlement with industrial activity (TR 36 NE 121), evidence for timber-framed buildings (TR 36 NE 455), a well shaft (TR 36 SE 35), a quarry (TR 36 NW 481), and numerous enclosures (TR 36 NW 255; TR 36 NE 85;TR 36 NE 584; TR 36 NW 1166), ditches (TR 36 SW 232; TR 36 NE 427; TR 36 NE 600; TR 36 SW 372), and gullies (TR 36 NW 503).

Post-medieval

During this period the Wantsum Channel silted up and the land was reclaimed, with the marsh areas of the former channel being used as pasture land for sheep. As one of the richest agricultural areas in the country, the area of the site and its vicinity remained heavily rural and agricultural in nature during the post-medieval period, but saw increasing quarrying activity, mainly for chalk but also targeting flint and clay.

Both agricultural and quarrying activities have been encountered on the site. The farmstead of Foster's Folly, with a loose courtyard plan and buildings to two sides of the yard, formerly existed on the location of the passenger and cargo area of the airport (MKE87020), while a mid-18th Century chalk mine, known as Manston Caves, was excavated and backfilled in antiquity in the eastern area of the site (TR 36 NW 437). Supporting the agricultural industry, two flour mills are also known from the site, and are pictured on old Ordnance Survey maps of 1839 and 1972 (TR 36 NW 1107).

The wider study area is dominated by these activities. There are twenty-six farmsteads, of which Bush Farm (MKE87023), Rose Farm (MKE88749), Manston Court (MKE87018) and Pouces (MKE86971) are located closest to the site boundary. Further farm buildings include a farmhouse and barn at Ozengell Grange (TR 36 NE 227), barns at Manston Grange Farm (TR 36 NW 228) and a former barn, dating from 1702 (TR 36 NW 1017). There are sixteen incidences of quarrying, primarily chalk pits, including a small chalk pit at Pouces Cottages (TR 36 NW 1125), Mount Pleasant Chalk pit (TR 36 NW 337) and Dellside chalk pit (TR 36 NW 328) located close to the site boundary. Other notable structures include foundations of the 19th Century Fever Hospital (TR 36 NW 1179) located to the south of the site, and an icehouse at Cleve Court (TR 36 NW 324) west of the site.

Modern

Expansion is observed in the modern period for the major townships, especially Ramsgate to the East. Increasing trade at the ports of Ramsgate and Margate following the Reformation and a surge in tourism created by the introduction of the railway linking London to these seaside towns in the mid-1840s, greatly increased the wealth of the region. The most significant change in the region saw the agricultural fields of the site itself converted for aviation use (TR 36 NW 432).

Beginning in the winter of 1915-16, during the early years of the First World War, aircraft began landing on the site, rather than the more precarious landing strip at St Mildred's Bay in Westgate. By the end of 1916 the site had become the Admiralty Aerodrome at Manston, with a training school for Handley Page bombers. The early airfield was on the area now occupied by the passenger terminal. Throughout WWI the aerodrome played an important role in the defence of Britain and was expanded to include four hangers, a barracks for 3000 men, and its own railway.

The RAF was officially formed on 1 April 1918 and the site became RAF Manston. During the 1930s, RAF Manston grew rapidly to become one of the busiest airfields in the country, partly due to its School of Technical Training.

RAF Manston was bombed heavily and badly damaged during the Battle of Britain. Despite this, due its strategic location close to Europe, from 1941 onwards Manston was used by damaged aircraft returning from operations, especially those from Bomber Command. In 1943, a large runway was built and was one of three in the country that was equipped to deal with emergencies. A fog investigation and dispersal operation (FIDO) was added to allow landings in any weather. RAF Manston played an important role in WWII, defending Canterbury, especially the cathedral, from attack, and as a base for Hurricanes and Typhoons.

During the Cold War in the 1950s, the US Air Force used Manston as a Strategic Air Command base for its fighter and fighter-bomber units for 8 years. In 1960 the airfield returned to the RAF and an Air Fire Training Centre was established on the site. Due to the long runway built during WWII it was designated one of the country's MEDAs (Master Emergency Diversion Airfield) for both military and civilian flights. In 1999 RAF Manston closed and the airfield became a civilian airfield, which ceased aviation activity in 2014, but has continued to be used for storage.

Numerous buildings and features on the site reflect the airfields significant military history, including ten pillboxes (TR 36 NW 1062; TR 36 NE 2168; TR 36 NW 1076; TR 36 NW 1059; TR 36 NW 1072; TR 36 NW 1048; TR 36 NW 1041; TR 36 NW 1043; TR 36 NW 1047; TR 36 NW 1059), air raid shelters (TR 36 NW 332; TR 36 NW 518), trench systems (TR 36 NW 1220; TR 36 NW 1222), and a former WWII oil depot (TR 36 NW 1183).

Within the study area features associated with RAF Manston are found, including WWI semi-underground hangars (TR 36 NW 1180; MKE92407; TR 36 NW 1203), a 1930s-bombing range (TR 36 NW 399), intelligence huts (MKE98029; MKE98029), and a dump of surplus equipment from the US use of the site (MKE97568). Most features during the modern period attest to the military importance of the area, including WWI use of the Union Workhouse as a military hospital (TR 36 NW 1196), gun emplacements (TR 36 SE 754; TR 36 SE 753; TR 36 NE 548), WWII defences and roadblocks (TR 36 NE 2166; TR 36 NW 1065; TR 36 NW 1050; TR 36 SW 408), trenches (TR 36 NW 398; TR 36 SE 31; TR 36 NW 1151; TR 36 NW 1140; TR 36 NW 1161; TR 36 NW 1221), Auxiliary unit- tunnels (TR 36 NW 1201), -observation post (TR 36 NE 2421) and -base (TR 36 NW 1200), and a further twenty pillboxes.

Several buildings and structures relating to the modern period are extant. These are described in table 4.2 (on site) and table 4.3 (off site), and include an assessment of their potential group value.

Table 4.2 Airfield related extant structures on the site

Reference UID	Name	Site phase	Description	Assessment of group significance
TR 36 NW 881	T2 Hangar	WWII	By 1940, with the development of aircraft, the Air Ministry, in collaboration with Teesside Bridge & Engineering, developed the Type T series hangar. The first design was the T2; a standard steel-fabricated unit of welded-and-bolted construction covered with galvanised corrugated iron, 22-gauge for the roof and 24-gauge for the walls. Manston's remaining T2 hangar underwent a rebuild during the 1980s that included a new floor, walls, roof cladding and re-wiring & electrics. Only the steel frame remains of the original WWII construction.	Despite rebuilding during the 1980's, the original steel frame remains and could be considered to be of group significance with other WWII structures.
TR 36 NW 882	Civil Control Tower	Recent	Following the departure of the RAF in 1999 a new control tower was constructed to the requirements of the CAA for civilian use. It was built over an existing pyrotechnic store which it is believed to have been built after the USAF left Manston in 1958.	Relates to recent use of the airport and of little historic significance.
TR 36 NW 883	Crash Fire Station	USAF	Manston Airport emergency crash fire station was built by the USAF in 1957 and was in use until the airport's closure in 2014. Much of the building is original construction although a viewing tower was subsequently added and the garage frontage was extended by 2.0m in 2000 to accommodate larger pump engines.	Relates to the USAF use of the site and of group significance with TR36 NW894.
TR 36 NW 884	Mechanical Transport Hangar	Recent	The mechanical transport hangar has been confused with earlier World War Two hangars that have been demolished since 1945. The current mechanical transport hangar was built c.1960 by Invicta Airlines to house and maintain Douglas DC4 aircraft.	Relates to recent use of the airport and is of little historic significance.
TR 36 NW 885	Aircraft Dispersal Bay	WWII	Built c.1940 this site is the only World War Two concrete dispersal bay surviving at Manston. It was used for the parking and protection of aircraft from enemy fighters and bombers and is surrounded by a protective earthwork bank on its northern side. A modern corrugated metal storage bunker currently sits on the bay.	Relates to the WWII use of the site and is of group significance.
TR 36 NW 886	RAF Manston Control Tower	WWII-recent	The former RAF Manston control tower built c.1941 was used until it was succeeded by the civilian control tower (TR 36 NW 882) in 1999. The building is believed to be a 12096/41 Night-fighter station watch office design with a portion built up to the level of the upstand beam with a new level added above at a later unknown date. The control tower has undergone many structural and cosmetic changes during its history with, most recently, the addition of cladding to the exterior.	Of group significance, but diminished by extensive structural and cosmetic changes since WWII.
TR 36 NW 887	Office Building	Recent	A post 1980 brick-built office building adjacent to the RAF control tower (TR 36 NW 886) used for airfield engineering.	Relates to recent use of the airport and is of little historic significance.
TR 36 NW 888	RAF Battle HQ	WWII	During the Second World War in common with most airfields RAF Manston had an armoured structure which was used to co-ordinate the defence of the airfield in case of land or air attack. It seems that these were built to a standard design incorporating a square observation post with 360 degree viewing apertures and a 'bomb proof' cap. Underneath are a series of brick built plotting and communication rooms.	Relates to WWII use of the site and is of group significance.
TR 36 NW 889	Civil Terminal	Recent	From about 1962 a part of RAF Manston was given over to civilian use as Manston Airport. The remainder of the airfield remained in the hands of the USAF. The original	The original USAF building was replaced by the current structure,

Reference UID	Name	Site phase	Description	Assessment of group significance
			terminal building was constructed in 1962 and was replaced by a new terminal in 1989.	which relates to recent use of the airport and is of little historic significance.
TR 36 NW 894	Royal Observer Corps Listening Post	USAF	A small concrete underground chamber built c1962 from where it was intended to monitor radioactive fallout in the event of nuclear attack. It formed part of the UK Warning and Monitoring Organisation, a national network of nuclear monitoring posts built between 1956 and 1964. It closed in 1991.	Relates to the USAF use of the site and of group significance with TR36 NW883.
TR 36 NW 892	Runway	WWII-Recent	RAF Manston's 3,000 yard tarmac 3-parallel runways were built in 1943 and were specifically designed to accept aircraft making crash-landings. Prior to the runways' construction, aircraft took off and landed on a series of grassed runways to the north of the current runway. During the 1950s the tarmac was replaced with a concrete runway. It is the tenth longest civilian runway in the United Kingdom	Initially constructed for WWII activity, it is of group significance with the other WWII assets.

Table 4.3 Airfield related extant structures close to the site

Reference UID	Name	**Site phase**	**Description**	**Assessment of group significance**
TR 36 NW 890	RAF Intelligence Hut	WWII	A wooden structure sited on the main camp side of the airfield. During WWII it was home to Station Intelligence from August 1940 to March 1943. Visitors included Churchill, Gen. Montgomery and Charles De Gaulle. The intelligence hut is currently home to Ramsgate Air Cadets.	Relates to WWII use of the site and is of group significance.
TR 36 NW 1180	Subterranean WWI hangar	WWI	Remains of a large hangar, suitable for Handley Page bombers and approached by gentle ramps. During WWI, the close proximity of the German bomber bases and the presence of active and aggressive naval flying units of the German navy encouraged the War Office to explore safer methods of hangaring at Manston. This aimed at removing aircraft from risk of surface bomb-blast by using sunken hangars built into the chalk bedrock. Four were intended. Two were built, and the other is now completely filled in. Now used as a riding school. Associated concrete blocks can still be seen.	Relates to WWI use of the site and can be considered to be of group significance with TR36 NW891 and potentially the Second World War structures as a development.
TR 3476 6519	Semi-sunken Brick Building	WWII?	A rectangular semi-subterranean brick-built bunker at the south east boundary of RAF Manston. An exact construction date and purpose of the bunker has not yet been established, though it is believed to have been built during WWII and used by a Fleet Air Arm detachment. It was later used as a store for Hoverspeed during the 1970s. The bunker currently functions as a privately-owned garage.	Potential for WWII group value is diminished by an uncertain construction date and purpose.
TR 36 NW 891	Former Married Quarters	WWI	A row of domestic buildings built c1900 that were used by service personnel from WWI as married quarters. The houses are now privately owned, though when they were sold by the MOD has not been established.	Of limited WWI and potentially also WWII group value due to uncertainty of alterations and private ownership.

Additionally, there are 14 potential protected military remains within the study area, 11 of which are located within the limits of the site. These assets are detailed in Table 4.4 below.

Table 4.4 Protected Military Remains within the study area

Reference UID	Name
DKE20136	ME109
DKE20248	BB893
DKE21799	Crash site of Messerschmitt Bf109E-4
DKE21805	Crash site of Heinkel HE 111H-2
DKE21806	Crash site of Messerschmitt BF110D
DKE21807	Crash site of Messerschmitt BF110D
DKE21808	Crash site of Supermarine Spitfire I
DKE21809	Crash site of Supermarine Spitfire I
DKE21823	Crash site of Bristol Blenheim
DKE21825	Crash site of Consolidated B24H Liberator
DKE21826	Crash site of Consolidated B24J Liberator
DKE21827	Crash site of Hawker Typhoon IB
DKE21828	Crash site of Hawker Typhoon IB
DKE21829	Crash site of Heinkel HE111H-2
DKE20136	ME109
DKE20248	BB893
DKE21799	Crash site of Messerschmitt Bf109E-4
DKE21805	Crash site of Heinkel HE 111H-2
DKE21806	Crash site of Messerschmitt BF110D
DKE21807	Crash site of Messerschmitt BF110D
DKE21808	Crash site of Supermarine Spitfire I
DKE21809	Crash site of Supermarine Spitfire I
DKE21823	Crash site of Bristol Blenheim

Archaeological events

There has been an extensive and lengthy programme of archaeological investigations undertaken within the study area. Archaeological work within the peninsula has revealed notable archaeological remains from all periods and provided evidence for settlement, burial, industry and agricultural production. Previous archaeological desk studies and investigations on the site and in the study area are shown on Figure 5 and significant results are detailed in tables 4.3 for events within the site boundary and 4.4 for events within the study area below.

Table 4.3 Previous archaeological investigations within the site boundary

Title	When	Who	Details
Manston Aerodrome 639613	1944	Ministry of Works	Bronze Age features were excavated during the 'Excavation on Defence Sites 1939-1945' project. A mostly destroyed ring ditch of a barrow and two burials were examined (TR 36 NW 34). No grave goods were recovered. Report: Grimes, W. F., 1960 *Excavations on Defence Sites 1939-1945,* Pages 1-248
Way/Manston Airfield 639598	1944	Ministry of Works	A possible Iron Age to Roman Age industrial settlement (TR 36 NW 182) was excavated after archaeological remains were identified during construction of the Monkton gas pipeline. The site included pits, a ditch, a wall foundation, and smaller finds such as a plumb bob, bronze pins, iron slag, Potin coins, and bones. Pottery dating to the late 14th century and 16th to 17th century was also found. Report: Grimes W. F., 1985, *Kent Archaeological Society, Archaeologia Cantiana: being contributions to the history and archaeology of Kent,* Vol 102, Page 59
Thanet Gas Pipeline, Phase I EKE3995	1971	Canterbury Archaeological Trust	Excavation for North Sea gas pipeline. 30 sites were investigated, of which 28 were previously unrecorded. The sites range in date from the Iron Age to Medieval period and include the Jutish Cemetery (TR 26 NE 13). Report: Operation Gas Pipe: Thanet Section (1973) No. 30 pages 298-301
Lord of the Manor 639618	1976-7 & 1977-82	Isle of Thanet Archaeological Unit	Excavations of a Neolithic enclosure, and Bronze Age barrow and ring ditch (TR 36 NE 132. Reports: 1977, *Kent Archaeological Society, Archaeologia Cantiana: being contributions to the history and archaeology of Kent,* Vol 92, Pages 245-5 Isle of Thanet Archaeological Unit Publication – Interim report
Monkton Gas Pipeline: Phases III- IV EKE4199	1983-4	Isle of Thanet Archaeological Unit	This pipeline follows the southern boundary of the site and archaeological remains from the Prehistoric to Post Medieval Period were exposed during construction. Associated monuments include a Neolithic pit (TR 26 NE 86), Bronze Age blade and fragments (TR 36 NW 193), burials and a cemetery from the Roman to Early Medieval to Anglo-Saxon Periods (TR 36 NW 186, 187 and 189), a Roman Age industrial/settlement site (TR 36 NW 182), and an Iron Age settlement site (TR 36 NW 190). Reports: Perkins, D. R. J., 1984, *The Thanet gas pipeline Phase III 1983,* 78 page 180 (article in serial) and Perkins, D. R. J. 1986, *The Monkton Gas Pipeline: Phases III & IV 1983-84,* CII pages 43-69 (article in serial)
Cliffs End 639614	1984	Isle of Thanet Archaeological Unit	During excavation to lay the Monkton-Ramsgate gas pipeline remains of a late Iron Age (possibly continuing into the early Roman period) settlement were encountered (TR 36 NW 190). The pipeline construction cut through pits and exposed animal bone, shells, and pottery sherds. Report: Perkins, D. R. J., 1985, *Kent Archaeological Society, Archaeologia Cantiana: being contributions to the history and archaeology of Kent,* Vol 102, Pages 63, 64-5
Thorne Farm 639609	1984	Isle of Thanet Archaeological Unit	A Roman cemetery and an Early Medieval cemetery were excavated during construction of the Monkton pipeline. The Roman Age cemetery included five inhumations and four cremation burials and grave goods (TR 36 NW187). The Anglo-Saxon cemetery was dated to the late 6th to mid 7th century and was three burials, with one grave covered by what may have been a small boat (TR 36 NW 186). Report: Perkins, D. R. J., 1985, *Kent Archaeological Society, Archaeologia Cantiana: being contributions to the history and archaeology of Kent,* Vol 102, Pages 52-4, 58-61, 63, 66-9
Watching Brief on the Sparrow Castle – Manston	1989	Trust for Thanet Archaeology	Iron Age, Roman period, WWII, and undated archaeological features were encountered during monitoring of pipeline

Title	When	Who	Details
Water Pipeline/ Sparrow Castle to Manston Pipeline, Birchington EKE 8131 660252			construction. Significant finds include Iron Ages pits containing pottery (TR 36 NW 368), Roman enclosures (TR 36 NW 205) and Roman Pits (TR 36 NW 369). Report: Trust for Thanet Archaeology, 1989, *An Archaeological Watching Brief on the Sparrow Castle – Manston Water Main* (unpublished document)
Geotechnical work at Manston Airport EKE11465	1999	Foundation and Exploration Services	During geotechnical work associated with the cargo hangers and apron taxiways, five boreholes and ten trial pits were dug. Report: Foundation and Exploration Services, 1999, *Kent International Airport Cargo Hangers and Apron Taxiways: Factual report on ground investigation.*
Evaluation of passenger and cargo side taxiways and aprons, Manston EKE11793	2000	Trust for Thanet Archaeology	Open area and trench excavations were conducted in four areas, resulting in the identification of archaeological features dating from the Bronze Age to the Medieval Period (TR 36 NW 466-471). Report: Trust for Thanet Archaeology, 2001, *London Manston Airport, Manston, Thanet, Kent: Archaeological Evaluations and Investigations of Passenger and Cargo side Taxiways and Aprons* (unpublished document)
189 Ramsgate Road, Broadstairs 1434919	2002	Trust for Thanet Archaeology	Prehistoric features and an Iron Age site where identified during excavation of a proposed residential development. Report: Trust for Thanet Archaeology, 2002, *189 Ramsgate Road, Broadstairs, Kent: an archaeological evaluation*
Survey of a Second World War air raid shelter, Manston EKE13134	2004	Kent Underground Research Group	While working near the Manston Airport terminal building, contractors broke though into a deep air raid shelter. A chalk cut shelter, most likely dating to 1940, was recorded (TR 36 NW 518). Report: Kent Underground Research Group, 2005, *Caves and Tunnels in South East England – Part 17* (unpublished document).
Trial trenching evaluation at the site of a new car-park, Manston Airport	2004	Swale and Thames Archaeological Survey Company	A series of multi-phase enclosures and a late Iron Age to early Roman Period settlement were encountered during excavations, which included 52 trial trenches (TR 36 NW 1176). Reports: Swale and Thames Archaeological Survey Company, 2004, *Archaeological evaluation of land east of the Kent International Airport, Manston, Isle of Thanet, Kent*
EDF Substation Site 1410715	2005	Museum of London Archaeology Service	Five trenches were excavated across the proposed substation location and identified Bronze Age flints, an undated post hole, and an undated pit. This work was informed by an earlier desk-based assessment. Report: Museum of London Archaeology Service, 2005, *EDF Substation, Manston, Kent: an archaeological evaluation report*
Excavation of area prior to pipe installation, Margate to Broadstairs EKE13336	2005	Wessex Archaeology	Over 600 archaeological features were recorded during work related to the construction of pipeline. The features date to all periods form the Neolithic to WWII (TR 36 NE 675, 676, and 677). Report: Wessex Archaeology, 2006, *Margate and Broadstairs Urban Wastewater Treatment Scheme*
Excavations along the route of the East Kent Access route (A256) EKE13407	2009-11	Oxford Wessex Archaeology Joint Venture	Field survey, evaluation trenching, and large-scale excavations were undertaken along the East Kent Access route. The excavations identified and recorded archaeological features and finds dating from the Palaeolithic through to WWII. Report: Oxford Wessex Archaeology Joint Venture, 2011, *East Kent Access (Phase II), Thanet Kent: Post-Excavation Assessment Volume 1*
Survey of Buildings and Structures Associated with Manston Airport and the Surrounding Areas	2016	Kent County Council	A survey commissioned by Kent County Council's Heritage Group, which is designed to provide an updated historic and strategic context for Manston airport and highlight extant buildings and structures in and around Manston airfield for inclusion to the Historic Environment Record.

Title	When	Who	Details
Geophysical survey	2016	AOC Archaeology Group	The preliminary results of a geophysical survey carried out in support of planning application OL/TH/16/0550 identified a density of potential archaeological anomalies, mainly to the far east, far west and central west of the Site. Report: WSP Parsons Brinckerhoff, 2016, *Environmental Statement, Volume 2, Appendix 10.1, Section 5.2 and Appendix C*
Trial trenching	2016	AOC Archaeology Group	Trial trenching was carried out in support of planning application OL/TH/16/0550. The results are not yet published.

Table 4.4 Previous off-site archaeological investigations

Title	When	Who	Details
Excavation of a Beaker Burial from Manston EKE8123	1987	Isle of Thanet Archaeological Unit (with Trust for Thanet Archaeology)	Excavation of a Late Neolithic/Early Bronze Age barrow (TR 36 NE 182) and Late Bronze Age/Early Iron Age pits and postholes within the barrow (TR 36 NE 406). Report: Perkins, D. R. J. & Gibson, A. M., 1991, *A Beaker Burial From Manston, Near Ramsgate.* Vol CVIII Pages 11-27
Monkton to Mount Pleasant (A253 Duelling) EKE8121	1994-5	Canterbury Archaeological Trust (with Trust for Thanet Archaeology)	Archaeological investigation in advance of widening of the A253. Post holes and associated beaker burials and a ring ditch (TR 26 NE 239 & 240), all dating to the Late Neolithic to Early Bronze Age, a 12th century farmstead and associated features (TR 26 NE 168), and a defensive World War II slit trench (TR 26 NE 238) were identified during the investigation. Reports: Canterbury Archaeological Trust, 1996, *Canterbury's Archaeology 1994-1995.* English Heritage Scheduling Section, 1999, *Anglo-Saxon Cemetery and Associated Remains at Monkton, 550m North of Walters Hall Farm*
Excavation at Kent International Park, Manston 1997 EKE8388	1994-7	Trust for Thanet Archaeology	Archaeological investigations were undertaken prior to development at Kent International Business Park. Archaeological remains excavated include Neolithic to Early Bronze Age features and finds (TR 36 NW 397), an Iron Age enclosure and associated features and finds (TR 36 NW 359), Medieval farmstead (TR 36 NW 246), a WWII slit trench (TR 36 NW 398) and a RAF bombing range used in the 1930s (TR 36 NW 399). Report: Trust for Thanet Archaeology, 1997, *Kent International Business Park, Manston 1994-97* (unpublished document)
Evaluation at Laundry Road, Minster EKE8122	1995	Isle of Thanet Archaeological Unit (with Trust for Thanet Archaeology)	Evaluation trenching along Laundry Road included the excavation of a Late Neolithic to Middle Bronze Age settlement and ditched enclosure (TR 36 NW 177), an Early Medieval or Anglo-Saxon inhumation burial in an irregular shallow pit (TR 36 NW 383), and an Iron Age pit with mammal remains and pottery sherds (TR 36 NW 382). Report: Trust for Thanet Archaeology, 1995, *Archaeological Evaluation at Laundry Road, Minster, Isle of Thanet* (unpublished document)
Evaluation on Land Adjacent to No.6 Laundry Road, Minster, Thanet EKE8342	1996	Trust for Thanet Archaeology	Evaluation conducted on land adjacent to No. 6 Laundry Road, which resulted in no significant archaeological finds. Report: Trust for Thanet Archaeology, 1996, *Archaeological Evaluation of Land Adjacent to No.6 Laundry Road, Minster, Isle of Thanet*
Excavations of an Iron Age pit and a Roman cave, Spratling Court Farm chalk pit, Manston EKE12956	1996-2007	Colin A. Baker	A Middle Iron Age chalk quarry pit and a Roman cave were observed in the section of a modern chalk pit (TR 36 NE 635 & 637). Worked flints and pottery, dated from the Late Mesolithic to Late Bronze Age, were found in association with the pit and cave (TR 36 NE 636). The original discovery was made in 1996 with additional work undertaken 2003-2008. Report: Colin A. Baker, 2010, *Excavations of an Iron Age pit and Roman cave at Manston in the Isle of Thanet: A report of*

Title	When	Who	Details
			stratigraphic and archaeological investigations at Spratling Court Farm chalk quarry, Manston, Kent, 1996-2007.
Watching Brief on Margate & Broadstairs WTW Enhancement Scheme EKE5692	2000	Wessex Archaeology	No archaeological remains were found during a watching brief carried out on geotechnical trail-pitting. Report: Wessex Archaeology, 2000, *Margate & Broadstairs WTW Enhancement Scheme. Archaeological Watching Brief During Site Investigation*
North Kent Coast Rapid Coastal Zone Assessment Survey Phase II: Field Assessment (Pilot) 46565 EWX8094	2002	Wessex Archaeology	First part of the pilot study, which involved non-intrusive field and photographic surveys and identified numerous archaeological features. Report: Wessex Archaeology, 2002, *North Kent Coast Rapid Coastal Zone Assessment Survey Phase II: Field Assessment (Pilot)*
Watching brief at Bradgate Caravan Park, Manston Court Road, Margate EKE11851	2002	Trust for Thanet Archaeology	Monitoring of road construction; no significant archaeological features or finds were observed, though a colluvial deposit was recorded which contained worked flints and medieval pottery. Report: Trust for Thanet Archaeology, 2003, *Bradgate Caravan Park, Manston Court Road, Margate, Kent: Evaluation and Watching Brief* (unpublished document)
Building survey of buildings at Manston Court Farm EKE12790	2004	Holt and Wooton Ltd	A survey of farmyard buildings, including Manston Court (Farmstead MKE87018). Report: Holt & Wotton, 2004, *Manston Court Farm Historic Building Report* (unpublished document)
Survey of buildings at Grove Farm, Manston EKE12055	2004	Trust for Thanet Archaeology	A survey of a farm building prior to demolition (TR 36 NW 1017). The barn is dated to 1702 AD and was formally a listed building. Reports: Trust for Thanet Archaeology, 2004, *Grove Farm, Manston Road, Manston, Kent: Archaeological Evaluation Report* Trust for Thanet Archaeology, 2005, *Grove Farm, Manston Road, Manston, Kent: Archaeological Assessment Report* (unpublished documents)
Survey, North Kent Coastal Zone: Phase II, Year Two 56751 EWX8626	2005	Wessex Archaeology	Numerous archaeological remains were identified and recorded during non-intrusive field surveys. Wessex Archaeology, 2002, *North Kent Coast Rapid Coastal Zone Assessment Survey: Phase II: Field Assessment Year 2 Report* (unpublished document)
Building survey of a pillbox on Manston Road allotments, Ramsgate EKE12291	2007	The Historic Environment Consultancy	Prior to demolition, a WWII Type 24 infantry pillbox was recorded (TR 36 NE 566). Report: The Historic Environment Consultancy, 2007, *Building Recording: Pillbox, Manston Road Allotments, Ramsgate*
Watching brief on land adjacent to 19 Mount Green Avenue, Cliffsend EKE12141	2007	Trust for Thanet Archaeology	During a watching brief on groundworks for piling, a ring-beam and a soakaway pit, archaeological features, indicating settlement in the prehistoric period, dating from the Neolithic to Early Bronze Age, were encountered (TR 36 SW 130). Report: Trust for Thanet Archaeology, 2007, *Land Adjacent to 19 Mount Green Avenue, Cliffsend, Ramsgate: Archaeological Watching Brief Report* (unpublished report)
Excavations at Thanet Earth 2007-2008	2007	Trust for Thanet Archaeology	During excavations on the Thanet Earth site prior to development, about 1500 feature groups of Neolithic, Bronze Age, Iron Age, Roman, Anglo-Saxon, Medieval and post-Medieval/modern date were identified. Report: Trust for Thanet Archaeology, 2010, *Excavations at Thanet Earth 2007-2008. Assessment Report Volume 1* (unpublished report)
Watching brief on geotechnical test pits on the East Kent Access route EKE12316	2008	Trust for Thanet Archaeology	During monitoring of geotechnical test pits several Prehistoric, Bronze Age, Iron Age and undatable features were identified, including ditches and a shell midden (TR 36 SE 720, TR 36 SW 235, 236 & 237).

Title	When	Who	Details
			Report: Trust for Thanet Archaeology, 2008, *East Kent access Phase 2: Archaeological monitoring of Test Pits* (unpublished document)
Archaeological evaluation at Thorne Farm, Kent EKE13367	2013	Wardell Armstrong Consulting Group	Archaeological evaluation undertaken at Throne Farm identified one early Iron Age ditch, three undated ditches and a possible Roman inhumation (TR 36 NW 109). Wardell Armstrong Archaeology, 2013, *Thorne Farm, Kent: Archaeological Evaluation Report*

4.7 Cartographic sources

The historic map regression exercise (Table 4.5) reveals how extensively the site has changed since the earliest available mapping, with the majority of that change occurring in the 20th Century. The wider area saw little change, other than minor settlement expansion and building change of use, except for areas outside of the site boundary but within the study area that were affected by or associated with aviation use of the site.

Table 4.5 Historic map regression

Source	Notes
1877 OS Map 1:10,560	**Onsite:** The site is shown as large field areas traversed by several roads or trackways. In the east and central area of the site, these run north-south, while in the north, the main routeway is aligned east-west. In the south-west area of the site a network of routes intersect, with the road later labelled Dunstrete running on an east-west alignment via Telegraph Hill. Windmill stones are marked to west of the centre of the site, and a district or borough boundary marking is drawn in the western area. The farmstead of Foster's Folly is present towards the east of the site. **Offsite:** The South-Eastern Railway Line runs in a north-east to south-west orientation to the south-east of the site. The 1877 extents of the nearby settlements of Manston to the east, Acol to the north-west, and Way, Cliffsend The Freehold, and Minster to the south are detailed, as well as other prominent buildings and farmsteads, including Prospect Inn to the west, the Isle of Thanet Union Workhouse to the south of the western boundary of the site, Ozengell Grange and Manor House at Lord of the Manor to the east, Vincent Farm, and Lydden Farm to the north, and Manston Court, Pouces, Rose Cottage, Cheeseman's Farm, Alland Grange, Cleve Court (including note of an Icehouse present) to the north-west.
1873-1894 OS Map 1:2,500	**Onsite:** The windmills are identified as flour mills. **Offsite:** No significant changes.
1888-1899 OS Map 1:10,560	**Onsite:** A building is now present between the windmill stones, while the eastern area of the site is labelled as 'St Lawrence Extra'. **Offsite:** A fever hospital is now present to the north, an infirmary to the east, and additional buildings to the south-west of the workhouse. Chalk pits are labelled to the south of the workhouse, east of Way and at Dellside and Cheeseman's Farm.
1896 OS Map 1:2,500	**Onsite:** No significant changes. **Offsite:** A limekiln is identified on Mount Pleasant to the west of the site.
1907 OS Map 1:2,500	**Onsite:** Osborne Road and roads leading off it to the south encroach on the south-east corner of the site. **Offsite:** A series of roads extends south from the south-east end of the site, with occasional buildings.
1908 OS Map 1:10,560	**Onsite:** Further roads are present in the northern area of the site to the south of the pre-existing routeway and in the eastern area of the site on its southern boundary. Additional stones are noted south of the windmills. A boundary in the east of the site identifies the Stour catchment area. **Offsite:** Extensive road expansion in the regions west of Vincents Farm and around Lydden Farm to the immediate north-west and north-east of the site respectively is seen. A cemetery has been added to the west of the workhouse and Minster Laundry built to the south of the site. To the east of Manston Court a series of properties named Isle of Thanet Union Cottage Homes has been built along with a hospital for infectious

Source	Notes
	diseases. The orchards around Way Farm and Minster House have expanded. Brickworks are noted east of Cliffsend.
1931 **1931-1932** **OS Map** **1:10,560**	**Onsite:** Buildings have been added on the south-east corner of the site. The catchment area boundary is now named 'Kent Rivers'. The roads added in 1908 in the northern area have been removed. **Offsite:** The buildings extending into the south-east corner of the site expand further south to the railway line, north of Cliffsend. The roads in the areas of Vincent Farm and Lydden Farm have been removed, At Manston Court buildings have been added to the west and south, along the boundary of the site. The Isle of Thanet Union Cottage Homes have been renamed 'Manston Cottage Homes'.
1931-1939 **1938** **OS Map** **1:10,560**	**Onsite:** No significant changes. **Offsite:** Caves labelled at Cheesemans Farm and Alland Grange.
1922 (revised 1932) **RAF Manston Site Plan** **539/22**	**Onsite:** The area of the airfield ends just west of Pouces nursery, and so does not cover the full area of the site. The northern area of the site (opposite Manston Court), contains recreation facilities buildings. Progressing south-east along the north-west boundary of the site buildings include the pump house and associated buildings, Wing Officer quarters, stores, rifle ranges, Garages, petrol stores, and a hangar. The main east-west routeway present on OS maps is marked and connects the east and west of the airfield. The east side of the airfield progressing north to south contains the married quarters just south of Manston Court, ballcourts, stores and leisure facilities to the north of the east-west road, and stores, offices and quarters south of the road. Foster's Folly and World's Wonder are marked. The runway is not marked. **Offsite:** The fields south-west of Pouces and Rose Cottage contain workshops and hangars. Surrounding Holmecroft and to the north-east, buildings house stores, offices, workshops, meteorological-monitoring buildings and quarters. The parade ground is adjacent to the training area further north-east, a field which also contains an airplane shed.
1938 **OS Map** **1:10,560**	**Onsite:** No significant changes. **Offsite:** Changes are observed in the land division and buildings adjacent to the northernmost boundary of the site, on the west side, and an area north-east of Pouces farm is marked but unnamed.
1939 **OS Map** **1:2,500**	**Onsite:** No significant changes **Offsite:** Rose Cottage becomes Holmecroft.
1938-1946 **OS Map** **1:10,560**	**Onsite:** No significant changes. **Offsite:** The workhouse is renamed the Isle of Thanet Public Assistance Institution. The Freehold has expanded westwards.
1945 **RAF Manston Site Plan** **3515/45**	**Onsite:** The airfield has expanded to include the western extent of the site. The east-west aligned runway is marked and dominates the southern area of the site. Along the north-west boundary of the site the larger buildings have been removed, including most of the recreation facilities buildings, revetments built, and smaller buildings moved or added. To the east, further buildings have been added to the south of the buildings on the southern side of the road, and tennis courts, previously present on the north side of the road have been replaced with a series of small buildings. **Offsite:** The Fido tanks are located just south of the runway to the east. A large area to the north of the western end of the runway contains a trackway which runs in an oval loop, with a hangar and three ancillary buildings. There are minimal alterations to area north-east of Holmecroft, and munition stores built to the north-eastern boundary of the training area. The changes to buildings outside the far north-west boundary of the Site seen on the 1938 OS map, are included as part of RAF Manston. It is unclear whether the buildings themselves at Pouces and Holmecroft are retained.
1945 **RAF Manston Site Plan** **3516/45**	**Onsite:** The plan identifies properties for requisition and their use. There are no properties within the site itself. **Offsite:** Pouces Farm and Holmecroft are within the boundary, but Foster's Folly is excluded. The properties outside the far north-west boundary are not included, contrary to plan 3515/45. Outside of the airfield there are no significant changes to the 1938 OS maps.
1945 **Aerial Photograph**	**Onsite:** n/a

Source	Notes
	Offsite: The area to the north-west of the site is dominated by fields of various crops with clear boundaries. The settlement of Acol, and farmsteads of Cheeseman's Farm, Cleve Court and Alland Grange are visible**.**
1945-1949 Aerial Photograph	**Onsite:** The site comprises a series of clearly defined fields, with the routeways evident. Buildings associated with the Foster's Folly farmstead can be seen. Cropmarks of linear and curvilinear features are observed. **Offsite:** The settlements of Way and Minster are visible, as are the buildings associated with Ozengell Grange and The Manor
1947-1948 1947-1949 1948 Aerial Photograph	**Onsite:** The runway, including the marked centre landing strip is clearly visible, as are the buildings along the eastern side of the northern area, as are a revetment and hanger at the southern extent of the west group of buildings, in a layout reflecting the 1945 RAF Manston site Plan 3515/45. In the northern area of site, new trackways are shown, along with new buildings associated with weather-monitoring to the west and barracks and facility buildings to the east. **Offsite:** The Fido tanks are visible to the south of the eastern end of the runway. Pouces Farm and Holmecroft to the west are still present, but the fields to the north and north-east contain numerous buildings and structures relating to RAF Manston, with a layout reflecting the 1945 RAF Manston Site Plan 3515/45. In the area to the north of the west end of the runway associated with RAF Manston, the looped trackway, hangar and ancillary buildings are visible.
1948 OS Map 1:10,560	**Onsite:** No significant changes. **Offsite:** The infectious diseases Hospital west of Manston has become a children's home.
1948-1951 OS Map, 1:10,560	**Onsite:** A rectangular area is marked containing the farms of World's Wonder and Foster's Folly. **Offsite:** Some expansion is shown north-east of Way, and expansion and further division of land is observed west of The Freehold. The Minster Laundry site has enlarged. The settled area between the railway line and the area just to the south of the east end of the site has expanded west. 'Manor House' to the east, is now labelled 'Lord of the Manor'.
1952 RAF Manston Site Plan 5209/52	**Onsite:** The area along the north-west boundary remains largely unchanged. In the eastern area, a new hangar, and aqua system has been built and a passenger terminal identified. **Offsite:** The area to the north-west of the site contains a slightly higher density of buildings than in 1945. The buildings at Pouces and Holmecroft have been removed.
1960-1961 1960-1962 1961 OS Map 10:10,000	**Onsite:** The 'Dunstrete' road has moved south of the unmarked runway. All other roads, stones and features on the Site have been removed, including the Osborne Street roads and buildings. The municipal borough boundary remains, and the area is now labelled Manston Airfield. A Roman coin hoard of 1630 is noted in the Telegrpah Hill area. In the eastern area Foster's Folly has been removed. **Offsite:** Pouces Farm and Holmecroft north-west of the site have been removed. The Isle of Thanet Public Assistance Institution is now Hill House Hospital and Romano-British cremations found in 1934 are noted to its west.
1963-1964 OS Map 1:2,500	**Onsite:** No significant changes. **Offsite:** Mount Pleasant has changed use to a caravan park.
1963-1964 OS Map 1:2,500	**Onsite**: New buildings are drawn south of Bush Farm in the east of the site. These are not known from military plans. **Offsite:** No significant changes.
1968 1968-1969 OS Map 1:10,000	**Onsite:** Airfield features, including the roads, bays and runway have been drawn in outline. The buildings are also shown, and, although similar, does not exactly reflect the 1952 plans (5209/52). The area is now labelled Manston Aerodrome. **Offsite:** The area of the airfield to the north of the west end of the runway is now drawn just west of Alland Grange, which is also noted to have a piggery. North of Alland Grange, Cheeseman's Farm has expanded. A new council depot is present north of the cemetery to the south-west of the site. Further south, The Freehold has expanded further west, and to the south-east Cliffsend has expanded eastwards.

Source	Notes
1973-1977 **1973-1975** **1975** **OS Map** **1:10,000**	**Onsite:** Two new buildings are drawn just south of the eastern end of the runway. The number of buildings to the east of the northern area of the site has reduced. **Offsite:** Fewer buildings are found in the fields adjacent to the north-west of the ite, and only the hangar building remains on the area to the north of the western end of the runway. To the south, the Ramsgate International Hoverport has been built at Cliffsend and The Freehold settlement has expanded further north. To the east, Anglo Saxon burials are noted north of Lord of the Manor and the former Nethercourt Farm has become a large housing spreading west into the western edge of the study area.
1977-1981 **OS Map** **1:2,500**	**Onsite:** The buildings to the south of Bush Farm have been removed. **Offsite**: A building has been removed and replaced with three buildings just south of Bush Farm, but outside of the boundary of the site.
1990-1991 **1991** **OS Map** **1:10,000**	**Onsite:** A building to the south-west of the site, south of the road is labelled Stones. Military plans identify this as an observation post. Two additional buildings are drawn in the passenger area. **Offsite:** South of the site, Hill House Hospital has gone, new buildings exist on the former site of Minster Laundry, and the centre, east and south east of Minster has expanded.
1991-1995 **OS Map** **1:10,000**	**Onsite:** The area is now labelled Kent International Airport and has a new terminal building outlined. Museums are identified. **Offsite:** The former Pouces and Holmecroft area to the north-west of the site has been developed. A garden with trees to the east of Manston Court is now a caravan park.
1996 **OS Map** **1:2,500**	**Onsite:** No significant changes. **Offsite:** The northern area of the extra airfield area north of the western end of the runway has become Kent International Business Park.
2006 **OS Map** **1:10,000**	**Onsite:** New buildings have been added, and existing buildings enlarged south of the passenger terminal. The museum buildings have also been altered. The definition of the features which make up the south of the runway has altered. **Offsite:** The area north of the western end of the runway has become Manston Park. The area of the former Workhouse and hospital has been replaced with housing and the former Minster Laundry with an industrial estate. To the east, the road layout near the Anglo-Saxon cemetery has changed and Nethercourt expanded further west.
2016 **OS Map** **1:10,000**	**Onsite:** Runway approach lights are marked. **Offsite:** The East Kent Access Road has been built, and a solar farm installed north of Manston Court.

5. Assessment of effects

The following assessment of archaeological potential of the site is based on the archaeological evidence as presented in baseline assessment of the site and study area as presented in Section 4 above and also relies on professional judgement. Archaeological potential is defined as low, medium, or high. Low archaeological potential indicates that there is no known evidence to suggest presence. Medium potential indicates evidence to suggest presence but is not presently known. High potential indicates that evidence is known to be present

5.1 Archaeological potential

Overall the evidence indicates a long history of human activity and occupation both on the site and within the study area, from earliest prehistory to the modern period. Development of the site throughout the 20th and 21st Century, in addition to heavy bombing during the wars and crash sites caused by emergency landings, will have disturbed and truncated archaeologically sensitive levels in some areas of the site; however, substantial buildings have been largely limited to the sides of the site, with the runway area to the south and centre portion of the northern area experiencing less development due to the nature of its use as an airfield.

Early prehistoric

The geographical location, geology and topography of the region, in addition to residual finds of stone tools and a potentially in-situ lithic working site indicate a **medium** potential for encountering deposits of geoarchaeological interest within the study area, including potential for undisturbed Pleistocene and early Holocene deposits. Therefore, the site also has a **medium** potential for encountering archaeological remains relating to the earlier prehistoric periods (the Palaeolithic and the Mesolithic) such as flake and blade flint tools, stone handaxes or bone and antler tools.

These early prehistoric remains, if found, could range between **local** to **national** significance as undisturbed Palaeolithic remains are nationally very rare.

Later prehistoric

There is **medium to high** potential for encountering archaeological remains relating to the later prehistoric periods. Neolithic finds have been recovered from the wider study area and Bronze and Iron Age activity is widespread both on the site and in the study area, forming part of a wider prehistoric landscape. Various artefacts such as pottery, flint tools and metal objects and features indicating settlement and occupation are known from the area of the site itself, with extensive evidence in the wider study area, indicating intensive and sustained occupation, settlement and use of the region during this period. The Iron Age to Roman Scheduled Ancient Monument 'Enclosure and ring ditches sited 180m east-northeast of Minster Laundry' (List Entry 1004203) provides further evidence for activity of this date to the south of the site.

These later prehistoric remains, if found, may be of **local** to **national** significance, and identify changes in settlement patterns and landscape and resource use over this period.

Roman

Roman activity has been identified within the site and in the area around the site in the form of settlement, agriculture and burials. In-situ evidence is known to be present beneath the trenches of former archaeological evaluation and so there is **medium to high** potential for encountering archaeological remains relating to this period. The preliminary results from a geophysical survey performed in support of planning application OL/TH/16/0550 also identified anomalies thought to be of Roman date on the site. Within the wider landscape the strategic geographical location of the site near the Wantsum Channel, presence of the Saxon Shore fort at Richborough and extensive archaeological finds from this period across the Thanet area confirms the importance of the region in this period.

These remains, if found, may be of **local** to **regional** significance, and provide further information regarding cultural, social and economic change in the Roman period, particularly in relation to the local environment and geographical location on the south-east coast.

Early medieval

Limited finds of Anglo-Saxon artefacts within the site indicate occupation and use during this period. The potential for encountering archaeological remains **medium** due to substantial evidence in the wider area, primarily related to burial practices, although settlement and agricultural land use are also represented. The geographical location is also of importance, given its proximity to the Kent coast with its history of Anglo-Saxon invasion. The Scheduled Ancient Monument, Anglo-Saxon Cemetery south of Ozengell Grange (List Entry 1004228), supports the evidence elsewhere in the study area.

These remains, if found, have the potential to be of **local** to **national** significance, and identify changes in land use and settlement following the withdrawal of the Roman armies.

Medieval

There is **medium to low** potential for encountering archaeological remains relating to the medieval period. Dunstrete was a major routeway and runs east-west across the southern area of the site. Finds of Medieval pottery and metal have been found on the site, as have features indicating occupation. Within the wider area, the exploitation of the landscape during this period would have included the area of the airport, and settlement is recorded during the period in the form of towns, villages, hamlets and isolated farms, including the major settlement of Minster to the south and the settlement at nearby Manston from the 12th Century.

These remains, if found, may be of **local** significance, and further inform us about changes in settlement land use patterns as the region develops, and by extension changes in the social and economic growth of the area.

Post-medieval

There is **medium to low** potential for encountering archaeological remains relating to the post-medieval period. Agricultural and quarrying activities have been encountered on the site, and dominate the activity in the wider study area. The main road continues in use and trackways across the site connect various post-medieval farmsteads. Historic maps indicate a series of field systems and very limited residential occupancy.

These remains, if encountered, are likely to be of **local** significance, and provide information regarding rural land use in the region during this period.

Modern

There is **medium to high** potential for encountering remains of archaeological interest relating to the modern period, which would most likely consist of remains relating to its use as an airfield. Successive phases of military use from the First World War to the Cold War, and recent commercial use has left archaeological remains and upstanding features, such as pillboxes, gun emplacements and trenches. The layout of the airport and buildings relates to the phases of development of the site, and document its prominent role, not only in the social and industrial development of the local area, but its wider role as part of the wartime defences of the south-east counties. While not listed, extant buildings and features dating to World War Two, both on and just outside the site, including the runway, original air traffic control tower and hangars, can be considered to have considerable group value pertaining to the history of the site and, more broadly, as an architectural or structural component of RAF military history and beyond.

These remains may be of **local** to **national** significance.

Summary

These assessments are summarised and presented in **Error! Reference source not found.** below.

Table 5.2 Assessment of Archaeological Potential

Time Period	Potential of encountering sub-surface archaeological remains	Potential significance of possible archaeological assets
Early prehistoric	Medium	Local/Regional/National
Later prehistoric	Medium/High	Local/Regional/National
Roman	Medium/High	Local/Regional
Early medieval	Medium	Local/Regional/National
Medieval	Medium	Local
Post-medieval	Medium/Low	Local
Modern	Medium/High	Local/Regional/National

5.2 Discussion of setting

Setting is defined in the NPPF as 'The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surrounding evolve. Elements of a setting may make a positive or negative contribution to the significance of the asset, may affect the ability to appreciate that significance or may be neutral' (Historic England, 2015b).

Historic England guidance follows this definition, and sets out a methodology for considering any effects on the significance of heritage assets arising from change to setting. This methodology comprises five steps:

- Step 1: identify which heritage assets and their settings are affected.
- Step 2: assess whether, how and to what degree these settings make a contribution to the significance of the heritage asset(s).
- Step 3: assess the effects of the proposed development, whether beneficial or harmful, on that significance.
- Step 4: explore the way to maximise enhancement and avoid or minimise harm.
- Step 5: make and Document the decision and monitor outcomes.

Within this study, visual change to setting was assessed on location and supported by the zone of theoretical visibility produced for the PEIR report (Chapter 11, fig.11.2), with impact of potential light pollution assessed using the models produced for the PEIR report (Chapter 11, fig. 11.13). Potential impact to setting from noise is considered within the recommended 60dB noise contour (Temple Group Ltd. 2014) and with reference to information recorded for the PEIR report (Chapter 12, table 12.10; 12.11).

Current baseline

Visual

The site is located at an elevation of between 40m and 55m AOD, similar to that of the western edges of Ramsgate and Broadstairs to the east. Immediately to the south and west, the land has a lower topography of c. 10m to 30m AOD, inhibiting visibility of the airport. The principal settlements of Ramsgate and Broadstairs are at distance with intervening built development. The smaller settlements are located at slightly lower elevations with moderate levels of vegetation cover. The raised location of the site, intervening built development and vegetation means that facilities at the non-operational airport are not visible to the majority of nearby visual receptors.

Noise

The former civil aerodrome closed in May 2014 and operational aviation noise is now limited to a helicopter charter business, operating from a hangar at the north of the site on Spitfire Way. Settlements close to the site, including Acol, Manston, Minster and Cliffsend currently experience average noise levels of between 51dB to 53dB during daytime hours and 45dB to 48dB during the night-time. Road traffic is the dominant cause of noise during the daytime, with levels of c. 60dB, and is lessened during the night-time due to decreased traffic flow to c. 45dB across the region.

Lighting

Within the broader area, the highest levels of light radiance are found at the Port of Ramsgate and at Thanet Earth. The principal coastal settlements have high levels of radiance due to highway lighting and floodlighting. Radiance levels decrease to moderate within the study area, and increase again around the northern and western areas of the site. Light spill is predominantly around settlements and industrial areas, with lighting columns present along sections of the A299.

Designated assets within the site

There are no designated assets within the site.

Designated assets outside the site boundary

The site, in its present form, has the potential to contribute to the setting of designated assets within a 1km radius, and to the Scheduled Monuments Monastic grange and pre-Conquest nunnery at Minster Abbey (List entry 1016850) and Saxon Shore fort, Roman port and associated remains at Richborough (List entry 1014642). Table 5.1 considers these assets by grade.

Table 5.1 Assessment of designated assets

Asset	Significance of setting	Assessment of effect
Scheduled Monuments Enclosure and ring ditches sited 180m east-northeast of Minster Laundry (List Entry 1004203)	The primary value of this scheduled monument is evidential and below ground. No archaeological remains are observable at ground level and so views towards the asset do not contribute to setting. Views from the asset may contribute to setting, as associated with the wider landscape character.	The airport is visible from the asset. There is some potential for this asset to be be associated with assets identified at the west end of the runway, but this is unconfirmed. The asset is positioned on a south-facing slope and the views south to the River Stour are most likely to have influenced the choice of location. Although within a 60dB noise contour (Figure 6), the setting of the site is not dependent on tranquillity. It lies adjacent to the A299 and the Minster Laundry industrial estate, and is currently subject to high levels of traffic noise. The asset is below ground and so light does not affect setting. It is in any case affected by light pollution from the adjacent Minster Laundry industrial estate. Changes to the proposed site may have a visual effect on the setting of this asset.

Anglo-Saxon Cemetery south of Ozengell Grange (List Entry 1004228)	The primary value of this scheduled monument is evidential and below ground. No archaeological remains are observable at ground level and so views towards the asset do not contribute to setting. Views from the asset may contribute to setting, as associated with the wider landscape character.	Views towards the airport are obscured by vegetation. Situated on the ridge, it is the views south towards the sea which are more likely to have influenced the choice of location, rather than the views to the west. Although a cemetery within the 60dB noise contour, the age of the remains and current appearance as a cultivated field means that the setting of the site is not dependent on tranquillity. Tranquillity is in any case disturbed by its location between the railway and the A299/A256, adjacent to a busy roundabout. The asset is below ground and so light does not affect setting. It is also adjacent to a large residential area with associated light radiance. Changes to the proposed site should have no effect on the setting of this asset.
Scheduled monuments with listed buildings Monastic grange and pre-Conquest nunnery at Minster Abbey (List entry 1016850)	The primary value of the nunnery lies below the monastic grange. The low-lying level of the ground at this location with high surrounding walls limits external views, enhancing a setting of isolation surrounding the grange. The extant buildings are the primary aesthetic concern.	The asset is surrounded by walls and the built environment. There are no long distance views. It is located within the settlement of Minster, close to the station, with associated noise and light radiance. This detracts from the sense of seclusion and remoteness provided by the boundary walls. The site does not lie within the 60dB noise contour and is at the very edge of the maximum average contour. Changes to the proposed site should have no effect on the setting of this asset.
Saxon Shore fort, Roman port and associated remains at Richborough (List Entry: 1014642)	The raised location of grade I Richborough Castle (List Entry 1363256) and the airport means that long distance visibility between the two sites is present; however, the main value of the setting of Richborough castle is now more immediate and related to the visible earthworks and standing walls. The original coastal setting has been lost over time and the remains now lie within a rural setting. The rest of the scheduled monument lies at lower levels, and its value is primarily evidential, with the structure of the Saxon shore fort itself (List Entry 1363256), being the primary aesthetic concern.	The asset is located at 5km distance from the site. Long-distance views include the airfield. They also include other large developments such as Thanet Earth. They are inhibited by topography, as the ridgeline creates a plateau which forms the immediate setting. Maximum noise level contours at 60dB, even for the largest planes do not reach as far as Richborough Castle. The castle is subject to noise from the railway and the A256. The site is not usually open during night-time hours, and so long distance views of

		operational lighting at the airfield will not affect normal visitor experience. Changes to the proposed site may have a long distance visual effect on the setting of this asset.
Grade II* listed buildings Barn about 50 metres east of Ozengell Grange (List Entry 1336669) Wayborough Manor (List Entry 1224593) Cleve Court and Cleve Lodge (List Entry 1224683)	The value of these Grade II* Listed Buildings primarily lies in their group value with associated buildings within the relevant complex.	There is no direct intervisibility between the assets and the airfield. While lighting may be visible at distance through the foliage at certain times of year, these assets will not be directly illuminated by airfield lighting and are currently indirectly subject to similar low levels of light pollution from nearby residential or industrial areas. Ozengell Grange and Wayborough Manor do not lie within the 60dB noise contour. The grounds of Cleve Court and Cleve Lodge do fall within the 60dB noise contour, but the buildings do not. Changes to the proposed site may have a noise effect on the setting of the grounds of Cleve Court and Cleve Lodge.
Grade II listed buildings- rural setting Ozengell Grange (List Entry: 1085377) Cheeseman's Farm (List Entry 1223803) Flete Lodge (List Entry 1204244) Barn at Preston Farm (List Entry 1085444) Chapel House (List Entry 1224336) Rose Cottage and Pansy Cottage (List Entry 1224339) Tudor Cottage (List Entry: 1224545) Way House and Wayborough House (List Entry: 1266887)	The value of these Grade II Listed Buildings primarily lies in their group value with associated buildings within the relevant farm or estate complex.	These assets do not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, these assets will not be directly illuminated by airfield lighting and are currently indirectly subject to similar low levels of light pollution from nearby residential areas. Changes to the proposed site should have no effect on the setting of these assets.
Grade II listed buildings- urban setting Psalm Cottage (List Entry: 1224337) Rose Cottage (List Entry:1266885) Bay Tree Cottage (List Entry:1224499)	These Grade II Listed Buildings are located within the urban settings of Minster, Manston, and Cliff's End and gain their value from their immediate environment as part of the character of those settlements.	The built environment obscures the view between the urban areas and the airfield. They will not be directly lit by the airfield and are subject to local levels of residential light pollution. They are not within the 60dB noise contour.

Granary about 25m south of Manston Court Farmhouse (List Entry:1336626) Remains of Monastic Building (List Entry:1085443) Manston Court and adjacent Wall (List Entry:1336625) Grove Farmhouse (List Entry:1085442) Barn at Manston Green (List Entry:1085445) Old Forge House (List Entry:1336624) Manston War Memorial (List Entry:1430779) 53 and 55 Foad's Lane (List Entry 1085409)		Changes to the proposed site should have no effect on the setting of these assets.
Grade II listed buildings- other Prospect Inn (List Entry: 1224448) Eastern of two Concrete Second World War 4-inch gun emplacements (List Entry 1429581)	Prospect Inn is currently part of a Holiday Inn hotel. Frequented by airmen stationed at Manston Airport, this building is associated with the historic aviation use of the site. The gun emplacement is associated with military use of the site. The value of its setting is in the evidential structure.	Continued use of the site as an airfield has historic links with these assets. Close to the airfield, visibility from Prospect Inn to the airfield is currently obscured by topography. Visibility of flights taking off from the airport will enhance setting given the historic links. Prospect Inn lies within the 60dB noise contour, but is adjacent to the A229, and so daytime noise is unlikely to have an adverse impact. The property will not be directly lit by the airport and is already affected by street lighting. Due to its function, any distant visible lighting associated with the airport would enhance the historic relationship. There is no visibility between the gun emplacement and the airfield due to topography, the built environment and distance. It does not lie within the 60dB noise contour. Distance precludes any change to setting from lighting. Changes to the proposed site may have a positive effect on the setting of Prospect Inn and no effect on the setting of the gun emplacement.
Conservation Areas Ramsgate	The primary value of these assets is in the historic buildings, location and composition of open space.	Visibility between all of these conservation areas and the airfield is obscured by topography, vegetation and the built environment. They do not lie

Broadstairs Minster Acol	Additionally, the settings of Ramsgate and Broadstairs near to the sea, as a reflection of function, contributes to their visual setting. The inland setting of Minster and Acol contributes to their semi-rural character.	within the 60dB contour, although they are likely to lie under the flightpath. As settlements, they produce light pollution. This is greater in the larger settlements of Ramsgate and Broadstairs. Changes to the proposed site should have no effect on the setting of these assets.

Non-designated assets within the site

The setting of extant buildings and features on the site and related structures within the study area (tables 4.2 and 4.3) are directly related to the historic use of these buildings as part of an airfield complex. Those identified as having group value pertaining to the history of the site and, more broadly, as an architectural or structural component of RAF military history and beyond, will have their setting enhanced by continued use of the site as an airfield. For the majority, it is association with the airfield which forms their primary value, and not views between contemporary buildings. One exception is the view between the RAF control tower and the runway which can be considered significant because of the relationship between setting and function. Illumination of these assets and noise associated with operational activity has the potential to enhance setting, by reflecting former function.

Historic landscape character

The airfield itself and the Wantsum Channel form the primary elements of the historic landscape character in this area. Continued aviation use is consistent with the historic character of the airfield and associated uses. The Wantsum channel will not be directly affected, Due to the topography of the site on a ridge in the landscape, views to and from the Wantsum Channel are very limited. Development at the site should cause no change to the historic landscape character of the area.

6. Conclusion and recommendations

6.1 Conclusion

The site lies within an area of moderate to high potential for Prehistoric and Roman archaeology, with moderate potential for Anglo-Saxon and Medieval remains. The site formed part of the medieval and post-medieval rural and industrial landscape, but experienced significant change in the 20th Century when it was converted for aviation use. It is this use which has shaped and influenced the local area in the modern period, and the role of the airfield during both World Wars and the Cold War have shaped both its history and contributed to the military history of the south-east.

The immediate surrounding area also evidences much archaeological activity from prehistoric flint, pottery and burials, Roman and Anglo-Saxon remains, to a post-medieval agricultural landscape as described in the baseline above which gives a strong indication that there is further potential for archaeological artefacts and deposits to be located on the site.

Despite modern disturbance and intrusion in some areas of the site, overall there is a high potential for the survival of archaeological remains from a variety of past time periods on the site, including potential for remains of potentially regional or national significance.

6.2 Recommendations

Preliminary geophysics results in support of planning application OL/TH/16/0550 suggested the presence of archaeological features on the site. In particular, high concentrations of anomalies were observed to the east of the runway, the west central area of the site and north-west of the passenger terminal. The results of trial trenching in this area will need to inform any future mitigation strategy, including potential for avoidance of assets or further intrusive investigation. The northern field was not covered as part of this work and further archaeological survey is recommended.

Archaeological monitoring during any below ground disturbance prior to further archaeological evaluation is also recommended, particularly where deep excavations are proposed such as any ground investigation works, as the potential for presence of remains of all periods is considered to be fairly high.

Liaison between the archaeological and geotechnical ground investigation team is recommended in order to share data regarding below ground conditions, deposit modelling and observation of boreholes and borehole logs, due to the high potential for prehistoric, including Palaeolithic, remains.

Due to the group value of extant modern features and buildings, a minimum of a level 2 building recording is recommended for buildings or structures being substantially altered or demolished.

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Appendix A
Figures

Figure 1 Site Location

Figure 2 Designated Archaeology within the 1km study area

Figure 3 Designated assets beyond the 1km study area

Figure 4 Non-Designated Archaeology

Figure 5 Archaeological investigations within the study area

Figure 6 Extent of 60dB noise contour

Appendix B
Historic Environment Gazetteers

Table B.1 Historic Environment Record: Archaeology

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE62996	FS	Medieval copper alloy brooch	Findspot	1100 AD to 1300 AD	Medieval
MKE65448	FS	Early Medieval copper alloy harness fitting	Findspot	1000 AD to 1100 AD	Early Medieval or Anglo-Saxon to Medieval
MKE73843	FS	Iron Age silver coin	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73868	FS	Iron Age copper alloy coin	Findspot	50 BC	Late Iron Age
MKE73869	FS	Iron Age copper alloy coin	Findspot	50 BC to 20 AD	Late Iron Age
MKE73875	FS	Iron Age copper alloy ring	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73915	FS	Iron Age copper alloy coin	Findspot	50 BC	Late Iron Age
MKE73917	FS	Iron Age silver coin	Findspot	50 BC	Late Iron Age
MKE73918	FS	Iron Age gold coin	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73920	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73921	FS	Iron Age copper alloy coin	Findspot	5 BC to 1 BC	Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE73922	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73923	FS	Iron Age copper alloy coin	Findspot	100 BC to 75 BC	Late Iron Age
MKE73924	FS	Iron Age copper alloy coin	Findspot	10 BC to 1 BC	Late Iron Age
MKE73951	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73956	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73958	FS	Medieval copper alloy weight	Findspot	1422 AD to 1475 AD	Medieval
MKE73959	FS	Iron Age copper alloy bow brooch	Findspot	100 BC to 43 AD	Late Iron Age to Roman
MKE73983	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73990	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73991	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73992	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73993	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73994	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE74000	FS	Medieval copper alloy brooch	Findspot	1066 AD to 1540 AD	Medieval to Post Medieval
MKE74003	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74029	FS	Iron Age copper alloy coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74041	FS	Iron Age copper alloy coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74082	FS	Early Medieval copper alloy brooch	Findspot	450 AD to 575 AD	Early Medieval or Anglo-Saxon
MKE74084	FS	Iron Age copper alloy coin	Findspot	40 BC to 25 BC	Late Iron Age
MKE74094	FS	Iron Age silver coin	Findspot	15 AD to 30 AD	Late Iron Age
MKE74101	FS	Iron Age coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74102	FS	Iron Age coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74117	FS	Iron Age coin	Findspot	100 BC to 150 BC	Late Iron Age to Middle Iron Age
MKE74131	FS	Iron Age coin	Findspot	15 AD to 30 AD	Late Iron Age
MKE74132	FS	Iron Age silver coin	Findspot	35 AD to 39 AD	Late Iron Age
MKE74146	FS	Iron Age coin	Findspot	1 AD to 15 AD	Late Iron Age
MKE74155	FS	Iron Age coin	Findspot	25 BC to 5 BC	Late Iron Age
MKE74156	FS	Iron Age coin	Findspot	5 BC to 1 BC	Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74164	FS	Roman silver finger ring	Findspot	200 AD to 300 AD	Roman
MKE74166	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74178	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74182	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74216	FS	Early Medieval gold pendant	Findspot	550 AD to 700 AD	Early Medieval or Anglo-Saxon
MKE74235	FS	Roman copper alloy hair pin	Findspot	43 AD to 402 AD	Roman
MKE74243	FS	Roman copper alloy coin	Findspot	332 AD to 333 AD	Roman
MKE74244	FS	Roman copper alloy coin	Findspot	351 AD to 353 AD	Roman
MKE74245	FS	Roman copper alloy coin	Findspot	41 AD to 250 AD	Late Iron Age to Roman
MKE74246	FS	Medieval copper alloy buckle	Findspot	1200 AD to 1550 AD	Medieval to Post Medieval
MKE74247	FS	Post Medieval copper alloy buckle	Findspot	1620 AD to 1680 AD	Post Medieval
MKE74248	FS	Medieval copper alloy buckle	Findspot	1350 AD to 1400 AD	Medieval
MKE74249	FS	Early Medieval copper alloy small long brooch	Findspot	400 AD to 599 AD	Roman to Early Medieval or Anglo-Saxon
MKE74250	FS	Early Medieval copper alloy small long brooch	Findspot	400 AD to 599 AD	Roman to Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74251	FS	Post Medieval copper alloy knife	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval
MKE74252	FS	Bronze Age ingots	Findspot	2350 BC to 701 BC	Bronze Age
MKE74253	FS	Bronze Age ingots	Findspot	2350 BC to 701 BC	Bronze Age
MKE74254	FS	Early Medieval brooch	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
MKE74255	FS	Early Medieval grave contents	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
MKE74256	FS	Iron Age grave contents	Findspot	800 BC to 42 AD	Iron Age
MKE74258	FS	copper alloy purse bar	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval
MKE74259	FS	Unknown copper alloy bead	Findspot	700 BC to 1600 AD	Early Iron Age to Post Medieval
MKE74260	FS	Unknown copper alloy bead	Findspot	700 BC to 1600 AD	Early Iron Age to Post Medieval
MKE74261	FS	Roman copper alloy spoon	Findspot	100 AD to 300 AD	Roman
MKE74262	FS	Bronze Age copper alloy hoard	Findspot	1200 BC to 700 BC	Middle Bronze Age to Early Iron Age
MKE74271	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74277	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74300	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74364	FS	Iron Age gold coin	Findspot	800 BC to 42 AD	Iron Age
MKE74388	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74389	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74409	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74413	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74414	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74415	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74424	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74425	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74430	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74432	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74434	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74435	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74450	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74456	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74462	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74463	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74466	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74479	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74492	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74500	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74501	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74512	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74513	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74514	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74515	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74519	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74543	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74544	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74545	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74549	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74550	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE80125	FS	Iron Age copper alloy harness fitting	Findspot	300 BC to 200 AD	Middle Iron Age to Roman
MKE80139	FS	copper alloy knife	Findspot	1020 BC to 800 BC	Middle Bronze Age to Late Bronze Age
MKE80144	FS	copper alloy chape	Findspot	1300 AD to 1500 AD	Medieval
MKE80149	FS	copper alloy mount	Findspot	1600 AD to 1800 AD	Post Medieval
MKE80159	FS	copper alloy spoon	Findspot	1600 AD to 1800 AD	Post Medieval
MKE80175	FS	Roman copper alloy unidentified object	Findspot	43 AD to 1800 AD	Roman to Post Medieval
MKE80176	FS	Early Medieval copper alloy brooch	Findspot	500 AD to 600 AD	Early Medieval or Anglo-Saxon
MKE80178	FS	copper alloy brooch	Findspot	43 AD to 100 AD	Roman
MKE80179	FS	copper alloy buckle	Findspot	1350 AD to 1450 AD	Medieval
MKE80180	FS	copper alloy coin	Findspot	71 AD	Roman to Unknown
MKE80184	FS	white metal blade	Findspot		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE86831	FRM	Plumstone Farm	Farmstead	1800 AD	Post Medieval
MKE86901	FRM	Outfarm north west of Cleve Court Farm	Farmstead	1800 AD	Post Medieval
MKE86902	FRM	Cleve Court Farm	Farmstead	1540 AD	Post Medieval
MKE86904	FRM	Street Farm	Farmstead	1800 AD	Post Medieval
MKE86916	FRM	Alland Grange Farm	Farmstead	1800 AD	Post Medieval
MKE86917	FRM	Wayborough Farm	Farmstead	1800 AD	Post Medieval
MKE86918	FRM	Outfarm west of Wayborough Farm	Farmstead	1800 AD	Post Medieval
MKE86961	FRM	Wayborough Farm	Farmstead	1800 AD	Post Medieval
MKE86962	FRM	Cheesman's Farm	Farmstead	1600 AD	Post Medieval
MKE86971	FRM	Pouces	Farmstead	1800 AD	Post Medieval
MKE86972	FRM	Thorne Farm	Farmstead	1540 AD	Post Medieval
MKE87015	FRM	Vincent Farm	Farmstead	1800 AD	Post Medieval
MKE87016	FRM	Fleet Farm	Farmstead	1800 AD	Post Medieval
MKE87017	FRM	Fleete Court	Farmstead	1800 AD	Post Medieval
MKE87018	FRM	Manston Court	Farmstead	1800 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE87019	FRM	Wood Farm	Farmstead	1800 AD	Post Medieval
MKE87020	FRM	Foster's Folly	Farmstead	1800 AD	Post Medieval
MKE87021	FRM	Manston Green Farm (Manstongreen Farm)	Farmstead	1800 AD	Post Medieval
MKE87022	FRM	Grove Farm (Manston Grove)	Farmstead	1800 AD	Post Medieval
MKE87023	FRM	Bush Farm	Farmstead	1800 AD	Post Medieval
MKE87024	FRM	Great Cliffsend Farm	Farmstead	1800 AD	Post Medieval
MKE87025	FRM	Farmstead at Cliffesend	Farmstead	1800 AD	Post Medieval
MKE87047	FRM	Litte Cliffsend Farm	Farmstead	1800 AD	Post Medieval
MKE87048	FRM	Ozengell Grange (Ozengell Farm)	Farmstead	1700 AD	Post Medieval
MKE87049	FRM	Sprattling Court Farm	Farmstead	1800 AD	Post Medieval
MKE87050	FRM	Preston Farm	Farmstead		
MKE88749	FRM	Rose Farm	Farmstead	1800 AD	Post Medieval
MKE88751	FRM	Cliffsend Farm (Bethlehem Farm)	Farmstead	1800 AD	Post Medieval
MKE91336	MON	Thorne Farm: possible Roman inhumation and possible undated ditch	Inhumation, ditch	100 AD	Roman to Unknown
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern
MKE91805	MON	Cropmark of a probable chalk pit visible on 1990 aerial photograph	Chalk pit		
MKE92407	MON	Reputed semi-underground hanger dating to First World War, shown on OS map	Hangar?	1914 AD to 1918 AD	Modern
MKE92417	MON	Possible neolithic pit, neolithic pottery and mesolithic and neolithic flints at Cliffs End Farm.			
MKE93154	MON	AUXILIARY UNIT OPERATIONAL BASE			
MKE97011	FS	Medieval Copper alloy brooch	Findspot		
MKE97017	FS	Post Medieval Copper alloy seal matrix	Findspot	1700 AD to 1800 AD	Post Medieval
MKE97061	FS	Copper alloy furniture fitting	Findspot	1650 AD to 1750 AD	Post Medieval
MKE97063	FS	Copper alloy dress hook	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval
MKE97064	FS	Copper alloy mount	Findspot	1600 AD to 1700 AD	Post Medieval
MKE97536	MON	Undated Pit, Bay View, Windsor Road, Ramsgate	Pit		
MKE97568	MON	Dump of surplus equipment from an American Airbase, South East of 'The Dump', Manston Road, Margate.	Refuse disposal site	1939 AD to 1950 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE97770	LB	Manston War Memorial	War memorial (freestanding)	1921 AD to 2050 AD	Modern
MKE97850	MON	Late Iron Age/ Early Roman Material (Manston)	Pit, linear earthwork	100 BC to 150 AD	Late Iron Age to Roman
MKE97851	MON	Post-Medieval Material and Features			
MKE98004	MON	Site of RNAS Manston			
MKE98024	MON	World War Two aircraft dispersal bay at the former Manston Airport.	Dispersal pen		
MKE98027	MON	World War Two RAF Battle HQ at the former Manston Airport.	Airfield defence site	1901 AD to 2050 AD	Modern
MKE98029	MON	RAF Manston intelligence hut.	Airfield building	1940 AD to 1943 AD	Modern
MKE98029	MON	RAF Manston intelligence hut.	Airfield building	1940 AD to 1943 AD	Modern
MKE98340	MON	Royal Observer Corps Listening Post	Underground monitoring post		
MKE98504	MON	Multi-compartment ?HE stores			
MKE98697	MON	Lidar and Air photo record of Ozengell Grange area; Neolthic and Bronze Age	Ring ditch, ring ditch, mound?	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
MKE98698	MON	Air Photo and Lidar mapping, Ozengel Grange, Ramsgate; Iron age and Roman	Enclosure, ditch, rectilinear enclosure, boundary	800 BC to 409 AD	Early Iron Age to Roman
MKE98701	MON	Air Photo and Lidar Mapping, Ozengell Grange, Ramsgate; Early Medieval/Anglo-Saxon	Grave	410 AD to 1065 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE98702	MON	Air photo and lidar mapping for land at Ozengell Grange, Ramsgate; Medieval	Rectilinear enclosure, pit, enclosure, feature	1100 AD to 1300 AD	Medieval
MWX43748	MON	Brick works, Pegwell	Brickworks	1908 AD to 1938 AD	Modern
TR 36 NE 108	MON	Double ditched ring ditch, near Ozengell Grange, Ramsgate	Pit, ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 NE 109	MON	Rectilinear enclosure, near Ozengell Grange, St. Lawrence, Ramsgate	Rectilinear enclosure, pit		
TR 36 NE 119	MON	Romano-British ditches and midden materials, Manston	Midden	43 AD to 409 AD	Roman
TR 36 NE 121	MON	Medieval settlement/industrial Site?, Manston, Thanet	Settlement?, industrial site?, enclosure, grubenhaus?, manor house?	1100 AD to 1399 AD	Medieval
TR 36 NE 127	MON	Possible Romano-British domestic site, Nethercourt, Ramsgate	Settlement?, cremation, ditched enclosure, post hole	43 AD to 409 AD	Roman
TR 36 NE 174	MON	Possible Roman pond, Manston	Chalk pit?, enclosure, pond?	43 AD to 409 AD	Roman
TR 36 NE 175	MON	Roman building and enclosure, near Lydden, Manston	Building, ditched enclosure	43 AD to 409 AD	Roman
TR 36 NE 177	MON	Roman Villa Farm at the site of Ozengell Grange, Ramsgate	Villa, inhumation, building	43 AD to 409 AD	Roman
TR 36 NE 181	MON	Barrow, North of Canterbury Road West, Manston	Barrow	2350 BC to 701 BC	Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 182	MON	Late Neolithic / early Bronze Age barrow, North of Canterbury Road West	Oval barrow	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 NE 2001	MON	Romano-British and Jutish features and associated finds, Nethercourt Estate, Ramsgate	Ditch, grave?	43 AD to 1065 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NE 2010	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2108	LB	OZENGELL GRANGE	Site, house, house, outbuilding, date stone	1711 AD to 1999 AD	Post Medieval to Modern
TR 36 NE 2166	MON	Second World War roadblock.	Defence work	1939 AD to 1945 AD	Modern
TR 36 NE 2168	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2170	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2171	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2178	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 223	MON	Romano-British quarry at Spratling Court Farm, Manston	Quarry	43 AD to 409 AD	Roman
TR 36 NE 2247	LB	BARN ABOUT 50 METRES EAST OF OZENGELL GRANGE	Site, timber framed barn, timber framed barn, timber framed barn, timber framed	1367 AD to 1799 AD	Medieval to Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
			barn, tithe barn, tithe barn, tithe barn, tithe barn, aisled barn, aisled barn, aisled barn, aisled barn		
TR 36 NE 227	MON	Farmhouse, barn and possible monastic grange, Ozengell Grange, Ramsgate	Barn, house, grange?	1066 AD to 1900 AD	Medieval to Post Medieval
TR 36 NE 2379	LB	BARN AT PRESTON FARM (TR 3507 6686)	Site, timber framed barn, aisled barn	1680 AD to 1720 AD	Post Medieval
TR 36 NE 2403	FS	Single small Palaeolithic handaxe discovered during the Margate and Broadstairs Urban Wastewater Treatment Scheme (2005 to 2006)	Findspot	C	Lower Palaeolithic to Middle Palaeolithic
TR 36 NE 2407	MON	Pair of ring-ditches that may be contiguous	Ring ditch		
TR 36 NE 2409	MON	Bronze Age to iron age features found during 2004 excavations	Hollow way, ditch, gully, pit, ditch, gully	1000 BC to 101 BC	Late Bronze Age to Middle Iron Age
TR 36 NE 2421	MON	Auxiliary Unit Observation Post	Auxiliary unit observation post	1940 AD to 1945 AD	Modern
TR 36 NE 245	MON	Undated ring ditch, St. Lawrence, Ramsgate	Ring ditch		
TR 36 NE 26	MON	Early medieval cemetery and associated finds, Ozengall, Ramsgate and Manston	Inhumation, cemetery, coffin	43 AD to 699 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NE 274	MON	Ring ditch cropmarks, Ozengell Grange, Ramsgate	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 275	MON	Ring ditch cropmarks, St. Lawrence, Ramsgate	Ring ditch		
TR 36 NE 276	MON	Ring ditch cropmarks, possible barrows, Ozengell Grange, Ramsgate	Ring ditch		
TR 36 NE 28	MON	Site of Upper Court Manor House, St. Lawrence, Ramsgate	Manor house, boundary ditch	1300 AD to 1475 AD	Medieval
TR 36 NE 283	MON	Ring ditch, north of Cliffs End	Ring ditch		
TR 36 NE 341	FS	Site of Romano-British building - Staner hill, Ramsgate	Findspot	43 AD to 409 AD	Roman
TR 36 NE 343	FS	Romano-British scatter, Stanton Hill, Manston	Findspot	43 AD to 409 AD	Roman
TR 36 NE 344	MON	Prehistoric pottery, Anglo-Saxon feature and finds, Ozengell Grange, Ramsgate	Post hole?	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NE 376	MON	Chalk pit at Coldswood Farm, Manston	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NE 377	MON	Chalk pit at Spratling court, Manston	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NE 397	MON	Prehistoric flint scatter, prehistoric pot and an undated pit, Manston Road, Ramsgate	Flint scatter, pit	2350 BC to 701 BC	Bronze Age
TR 36 NE 40	MON	Two Iron Age pits found on Thirlmere Avenue, Nethercourt, Ramsgate	Pit	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 402	MON	Newington windmill	Windmill	1540 AD to 1900 AD	Post Medieval
TR 36 NE 406	MON	Late Bronze Age/early Iron Age postholes & pits, north of Canterbury Road West, Manston	Post hole, pit	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NE 427	MON	Bronze Age/Early Medieval/Medieval site, Manston Rd	Ditch, ditch, pit, post hole, wall	2350 BC to 1539 AD	Early Bronze Age to Medieval
TR 36 NE 455	MON	Saxo-Norman buildings and enclosures, Manston Road, Ramsgate	Grubenhaus, enclosure, ditch, timber framed building, enclosure, timber framed building, pit, oven	1050 AD to 1225 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NE 471	MON	Late Bronze Age settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Enclosed settlement, ditch, gully, post built structure, quarry, pit, post hole, post built structure	1000 BC to 701 BC	Late Bronze Age
TR 36 NE 477	MON	Early Neolithic shallow cut found on site of new Tesco store south of Manston Road, Ramsgate	Pit	4000 BC to 2351 BC	Neolithic
TR 36 NE 484	MON	Middle Bronze Age settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 NE 485	MON	Anglo-Saxon settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Grubenhaus, ring ditch, ditch	500 AD to 699 AD	Early Medieval or Anglo-Saxon
TR 36 NE 486	MON	Post-Medieval settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Trackway	1540 AD to 1900 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 51	MON	Late Neolithic enclosures renovated and used as barrows in the Bronze Age, Ozengell Grange, Manston	Round barrow, henge, crouched inhumation, cremation	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NE 511	FS	Bronze Age flints, Bradgate Caravan Park	Findspot	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NE 54	MON	Bronze Age round barrow, Manston	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NE 548	MON	Possible machine gun post in Stannar Court	Fortification	1939 AD to 1945 AD	Modern
TR 36 NE 56	MON	Barrow/ring ditch cropmark features, Nethercourt, Ramsgate	Round barrow, ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 NE 566	MON	Former site of a Second World War pillbox, Manston Road	Pillbox, pillbox	1939 AD to 2007 AD	Modern
TR 36 NE 577	FS	Mesolithic worked flints, Manston Road, Ramsgate	Findspot	10000 BC to 4001 BC	Mesolithic
TR 36 NE 578	FS	Neolithic worked flints, Manston Road, Ramsgate	Findspot	4000 BC to 2351 BC	Neolithic
TR 36 NE 579	MON	Late Bronze Age enclosure and pits, Manston Road, Ramsgate	Enclosure?, ditch, pit	1000 BC to 701 BC	Late Bronze Age
TR 36 NE 580	MON	Late Bronze Age/Early Iron Age field system, Manston Road, Ramsgate	Field system, ditch, trackway, pit	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NE 581	MON	Iron Age field system, Manston Road, Ramsgate	Field system, ditch, trackway	800 BC to 401 BC	Early Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 582	MON	Roman cremations, Manston Road, Ramsgate	Cremation, quarry, ditch, grave marker?, post hole, ditch	43 AD to 409 AD	Roman
TR 36 NE 583	MON	Anglo-Saxon occupation, Manston Road, Ramsgate	Grubenhaus, post hole, stake hole	475 AD to 700 AD	Early Medieval or Anglo-Saxon
TR 36 NE 584	MON	Medieval enclosures, Manston Road, Ramsgate	Enclosure?, ditch	1075 AD to 1225 AD	Medieval
TR 36 NE 588	FS	Anglo-Saxon gold shilling ('thrymsa'), Isle of Thanet	Findspot	600 AD to 675 AD	Early Medieval or Anglo-Saxon
TR 36 NE 589	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 590	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 591	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 592	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 593	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	789 AD to 796 AD	Early Medieval or Anglo-Saxon
TR 36 NE 594	FS	Anglo-Saxon copper alloy 'styca', Isle of Thanet	Findspot	810 AD to 840 AD	Early Medieval or Anglo-Saxon
TR 36 NE 595	FS	Anglo-Saxon silver penny, Isle of Thanet	Findspot	765 AD to 792 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 598	MON	Neolithic settlement, Preston Park Caravan Site	Curvilinear enclosure, ditch, gully, pit	4000 BC to 3001 BC	Early Neolithic
TR 36 NE 599	MON	Early Bronze Age gully, Preston Park Caravan Site	Gully	1700 BC to 1501 BC	Early Bronze Age to Middle Bronze Age
TR 36 NE 600	MON	Medieval ditches, Preston Park Caravan Site	Ditch	1100 AD to 1175 AD	Medieval
TR 36 NE 601	MON	Middle Bronze Age cremation cemetery, Manston Road, Ramsgate	Cremation cemetery, cremation, ritual pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 NE 634	FS	Mesolithic or Neolithic worked flints, Spratling Court Farm, Manston	Findspot	10000 BC to 2351 BC	Early Mesolithic to Late Neolithic
TR 36 NE 635	MON	Middle Iron Age chalk quarry, Spratling Court Farm, Manston	Quarry	400 BC to 101 BC	Middle Iron Age
TR 36 NE 636	FS	Worked flints and pottery in hillwash deposits, Spratling Court Farm, Manston	Findspot	7000 BC to 701 BC	Late Mesolithic to Late Bronze Age
TR 36 NE 637	MON	A Roman cave, Spratling Court Farm	Dene hole?	43 AD to 409 AD	Roman
TR 36 NE 673	MON	Undated features, Manston Green, Ramsgate, Kent	Pit, post hole?		
TR 36 NE 674	FS	2 Conjoining Early Post-Medieval Peg Tiles, Manston Green, Ramsgate	Findspot	1540 AD to 1650 AD	Post Medieval
TR 36 NE 679	MON	Second World war roadblock at A256 Haine Road, Hollins Bottom.	Roadblock		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 85	MON	Cropmark of enclosure and curvilinear feature, Lydden, Manston	Enclosure, curvilinear enclosure, ditch	1066 AD to 1539 AD	Medieval
TR 36 NE 87	MON	Possible barrow cropmark, Manston	Barrow?	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NE 88	MON	Ditched enclosure cropmark, Manston	Macula, ditched enclosure?	43 AD to 409 AD	Roman
TR 36 NW 1012	LB	OLD FORGE HOUSE	Site, house, date stone	1743 AD	Post Medieval
TR 36 NW 1013	LB	WAY HOUSE AND WAYBOROUGH HOUSE, AND GARDEN WALL ATTACHED	Site, timber framed house, house, garden wall, outbuilding	1550 AD to 1799 AD	Post Medieval
TR 36 NW 1015	LB	BARN AT MANSTON GREEN	Site, timber framed barn, aisled barn, barn	1550 AD to 1780 AD	Post Medieval
TR 36 NW 1017	MON	Former site of a barn about 50 metres south west of Grove Farmhouse	Site, timber framed barn, aisled barn	1702 AD	Post Medieval
TR 36 NW 1018	LB	GROVE FARMHOUSE AND WALLED FRONT GARDEN	Site, house, steps, garden wall	1800 AD to 1832 AD	Post Medieval
TR 36 NW 1031	LB	GRANARY ABOUT 25 METRES SOUTH OF MANSTON COURT FARMHOUSE	Site, granary, timber framed building, staddle stone	1700 AD to 1799 AD	Post Medieval
TR 36 NW 1041	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1043	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1044	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1046	LB	PROSPECT INN	Site, public house, public house, conservatory	1939 AD to 1969 AD	Modern
TR 36 NW 1047	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1048	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1049	LB	TUDOR COTTAGE, WAY HILL	Site, jettied house, house	1500 AD to 1986 AD	Medieval to Modern
TR 36 NW 1050	MON	ANTI INVASION DEFENCE SITE	Defence	1939 AD to 1945 AD	Modern
TR 36 NW 1052	LB	CLEVE COURT AND CLEVE LODGE	House, site, house, service wing, timber framed building, steps, house	1540 AD to 1900 AD	Post Medieval
TR 36 NW 1055	LB	FLETE LODGE	Site, house	1820 AD to 1860 AD	Post Medieval
TR 36 NW 1059	MON	PILLBOX	Pillbox, pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1059	MON	PILLBOX	Pillbox, pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1060	LB	CHEESEMAN'S FARM	Site, farmhouse, farmhouse	1600 AD to 1866 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1062	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1064	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1065	MON	ANTI INVASION DEFENCE SITE	Defence	1939 AD to 1945 AD	Modern
TR 36 NW 1068	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1071	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1072	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1075	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1076	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1077	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1086	CRA	Crash site of Supermarine Spitfire I	Aircraft crash site, spitfire	1940 AD	Modern
TR 36 NW 1087	CRA	Crash site of Supermarine Spitfire I	Aircraft crash site, spitfire	1940 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1088	CRA	Crash site of Messerschmitt Bf110D	Aircraft crash site, me110	1940 AD	Modern
TR 36 NW 1089	CRA	Crash site of Messerschmitt Bf110D	Aircraft crash site, me110	1940 AD	Modern
TR 36 NW 1090	CRA	Crash site of Heinkel He 111H-2	Aircraft crash site, he111	1940 AD	Modern
TR 36 NW 1091	CRA	Crash site of Messerschmitt Bf109E-4	Aircraft crash site, me109	1940 AD	Modern
TR 36 NW 1095	MON	Cropmark of a ring ditch, to the north of Minster, Thanet	Ring ditch		
TR 36 NW 1096	MON	Cropmarks of four ring ditches, to the north of Minster, Thanet	Ring ditch		
TR 36 NW 1097	MON	Thorne Farm: Two shallow ditches, undated	Ditch		
TR 36 NW 1099	MON	Thorne Farm: Two shallow ditches, early Iron Age and undated	Ditch, ditch	750 BC to 400 BC	Late Bronze Age to Middle Iron Age
TR 36 NW 1100	MON	Linear cropmark features Way Farm cottages	Linear feature		
TR 36 NW 1102	MON	Linear cropmarks at Lord of the Manor, Thanet	Linear feature		
TR 36 NW 1106	MON	Possible ring-ditch on 1982 aerial photograph but not visible on south-west side. On 1967 aerial photo it appears to be a chalk pit	Ring ditch?, chalk pit?		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1108	MON	Romano-British burials and cremations discovered during excavation and pipeline work	Inhumation cemetery, cremation cemetery	43 AD to 409 AD	Roman
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1111	MON	"The Manor House", Lord of the Manor, Manston	Toll house	1830 AD	Post Medieval to Unknown
TR 36 NW 1122	MON	Cropmark of a possible chalk pit at Thorne Farm	Chalk pit?		
TR 36 NW 1123	MON	Linear parallel cropmarks east of Thorne Farm	Linear feature	1540 AD to 1860 AD	Post Medieval
TR 36 NW 1125	MON	Dew-pond or small chalk pit, Pouces Cottages	Chalk pit?	1540 AD to 1860 AD	Post Medieval
TR 36 NW 1127	MON	Cropmark of a probable chalk pit, middle of a line of three between Way Hill and Thorne Hill	Chalk pit		
TR 36 NW 1128	MON	Cropmark of a probable chalk pit, westernmost of a line of three between Way Hill and Thorne Hill	Chalk pit		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1128	MON	Cropmark of a probable chalk pit, easternmost of a line of three between Way Hill and Thorne Hill	Chalk pit		
TR 36 NW 1130	MON	Cropmark of a probable chalk pit, east of Wayborough House	Chalk pit?		
TR 36 NW 1131	MON	Cropmark of a probable small chalk pit, north-east of Thorne Farm adjacent to a concrete farm track	Chalk pit?		
TR 36 NW 1133	MON	Cropmarks of possible very small pits adjacent A253 north of Cliffsend	Pit		
TR 36 NW 1135	MON	Crop-soil markings showing two ring-ditches, Way	Ring ditch		
TR 36 NW 1136	MON	Roman circular enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, stock enclosure?	43 AD to 409 AD	Roman
TR 36 NW 1137	MON	Roman fields and enclosures, possibly part of a 'ladder' settlement discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure	43 AD to 409 AD	Roman
TR 36 NW 1138	MON	Roman trackway discovered during the East Kent Access Route excavations (2009-2011)	Trackway	43 AD to 409 AD	Roman
TR 36 NW 1139	MON	Early bronze age pit discovered during the East Kent Access Route excavations (2009-2011)	Pit	2350 BC to 1501 BC	Early Bronze Age
TR 36 NW 1140	MON	Second World War zig-zag trench discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1141	MON	Medieval linear feature discovered during the East Kent Access Route excavations (2009-2011)	Linear feature	1050 AD to 1350 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NW 1142	MON	Three Anglo-Saxon graves discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	500 AD to 699 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1143	MON	Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation	500 AD to 699 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1144	MON	Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 699 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NW 1145	MON	Two Anglo-Saxon hollow ways discovered during the East Kent Access Route excavations (2009-2011)	Hollow way	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1146	MON	Romano-British cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation	43 AD to 409 AD	Roman
TR 36 NW 1147	MON	1st to 3rd century AD cemetery and enclosure discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, cremation, inhumation, enclosure, oven?	43 AD to 409 AD	Roman
TR 36 NW 1148	MON	Possible iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, field system?	800 BC to 42 AD	Iron Age
TR 36 NW 1149	MON	Late Anglo-Saxon pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	850 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1151	MON	Second World War defensive trenches discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1152	MON	Late bronze age enclosure, ditches and pit discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, pit, ditch	1000 BC to 701 BC	Late Bronze Age
TR 36 NW 1153	MON	Early to middle iron age post-built structures, ditch, pit and inhumation discovered during the East Kent Access Route excavations (2009-2011)	Post built structure, pit, post hole, ditch, inhumation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1154	MON	Two large trackways of late iron age / Roman date discovered during the East Kent Access Route excavations (2009-2011)	Trackway	100 BC to 409 AD	Late Iron Age to Roman
TR 36 NW 1154	MON	Two large trackways of late iron age / Roman date discovered during the East Kent Access Route excavations (2009-2011)	Trackway	100 BC to 409 AD	Late Iron Age to Roman
TR 36 NW 1155	MON	Five sunken-feature buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus, inhumation, post hole, pit, hearth	43 AD to 409 AD	Roman
TR 36 NW 1156	MON	Small Roman cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 409 AD	Roman
TR 36 NW 1157	MON	One inhumation and two cremations discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 409 AD	Roman
TR 36 NW 1158	MON	Roman linear features discovered during the East Kent Access Route excavations (2009-2011)	Ditch	43 AD to 409 AD	Roman
TR 36 NW 1159	MON	Anglo-Saxon trackway discovered during the East Kent Access Route excavations (2009-2011)	Trackway	410 AD to 1065 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1160	MON	Small Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1161	MON	Second World War zig-zag defensive trench discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1162	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1163	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1164	MON	Small bronze age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1165	MON	Seven probable bronze age inhumation burials and one cremation discovered during the East Kent Access Route excavations (2009-2011)	Inhumation, cremation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1166	MON	Medieval field or enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure?	1066 AD to 1539 AD	Medieval
TR 36 NW 1167	MON	Iron Age horseshoe enclosure, ditches and boundaries discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, pit, ditch	500000 BC to 42 AD	Prehistoric
TR 36 NW 1168	MON	Possible Roman or medieval features discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, ditch, pit	43 AD to 1539 AD	Roman to Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1169	MON	Bronze Age barrow (possibly with neolithic origins) discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, pit	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 NW 1170	MON	Bronze Age barrow (possibly with neolithic origins) discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, grave, inhumation, ditch	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 NW 1171	MON	Bronze Age barrow discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, inhumation, ditch, pit?	2350 BC to 42 AD	Early Bronze Age to Late Iron Age
TR 36 NW 1172	MON	Iron Age or Roman pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1173	MON	Bronze Age pit, discovered during the East Kent Access Route excavations (2009-2011)	Pit	2350 BC to 701 BC	Bronze Age
TR 36 NW 1174	MON	Iron Age features, including probable post-built structure and inhumation discovered during the East Kent Access Route excavations (2009-2011)	Post hole, post built structure, inhumation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1176	MON	Late iron age / early Roman settlement and enclosures, Manston Airport car-park	Enclosure, pit, gully, grubenhaus, quarry, pottery kiln, cremation	100 BC to 125 AD	Late Iron Age to Roman
TR 36 NW 1177	FS	Early medieval pottery fragments recovered during excavation	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1178	FS	Roman pottery has been recorded at this location. No further details.	Findspot	43 AD to 409 AD	Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1179	MON	Foundations associated with the 19th century Fever Hospital, discovered during the East Kent Access Route excavations (2009-2011)	Infectious diseases hospital, well	1836 AD	Post Medieval to Unknown
TR 36 NW 1180	MON	Semi-underground hangar dating to First World War, still partly extant	Hangar?	1914 AD to 1918 AD	Modern
TR 36 NW 1182	BLD	Possible nissen hut, maybe of Second World War origin, noted in 2008 desk-based assessment	Nissen hut?	1939 AD to 1945 AD	Modern
TR 36 NW 1183	MON	Former Second World War oil depot, Canterbury Road West, Ramsgate	Storage tank, control room, pump house	1944 AD to 1960 AD	Modern
TR 36 NW 1191	MON	Early Roman Cremation Burials and Roman Pottery (Manston Road)	Cremation burial, cremation pit	43 AD to 200 AD	Roman
TR 36 NW 1194	MON	Prehistoric Features, Pottery and Struck Flint, Manston Road	Linear feature, curvilinear enclosure, plough marks	500000 BC to 42 AD	Prehistoric
TR 36 NW 1195	MON	Undated Archaeological Features, Manston Road	Pit, post hole, ditch, linear feature		
TR 36 NW 1196	MON	Hill House Military Hospital, Minster, Ramsgate	Hospital	1914 AD to 1918 AD	Modern
TR 36 NW 1200	MON	Second World War Auxiliary Unit base. Top of Windsor Road, Cliffsend.	Auxiliary unit operational base	1940 AD to 1945 AD	Modern
TR 36 NW 1201	MON	Alland Grange Farmhouse: Set of tunnels used by a Special Duties Organisation (Auxiliary units).	Auxiliary unit operational base	1940 AD to 1945 AD	Modern
TR 36 NW 1202	MON	Pillbox	Pillbox	1940 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1203	MON	Semi-underground hangar dating to First World War, never finished.	Aircraft hangar	1914 AD to 1918 AD	Modern
TR 36 NW 1220	MON	Trench system visible as crop marks	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1221	MON	Zig-zag trench system visible as earthworks	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1222	MON	zig-zag trench system	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 123	MON	Barrow cropmark feature, near Retreat Farm, Margate	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 1237	MON	?1946 aerial shows very clearly large semi-circle cluster of accommodation units fronting on Manston Road.			
TR 36 NW 1238	MON	Approx site of ?radar array			
TR 36 NW 1242	MON	Approximate position of 'Klein-kampfanlage' shown on 11.1940 Luftwaffe map			
TR 36 NW 1243	MON	Position of 'Radio Station' shown on 11.1940 Luftwaffe map.			
TR 36 NW 1244	MON	Approximate position of 'Klein-kampfanlage' .			
TR 36 NW 1245	MON	?Ammunition WWII store.			

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1246	MON	?Ammunition WWII store			
TR 36 NW 1247	MON	?Ammunition WWII store			
TR 36 NW 1249	MON	?Ammunition WWII store			
TR 36 NW 1250	MON	?Ammunition WWII store			
TR 36 NW 1251	MON	?Ammunition WWII store			
TR 36 NW 1252	MON	?Ammunition WWII store			
TR 36 NW 1253	MON	?Ammunition WWII store			
TR 36 NW 1254	MON	Bank to ?			
TR 36 NW 1255	MON	?Ammunition WWII store			
TR 36 NW 1256	MON	?Ammunition WWII store			
TR 36 NW 1257	MON	?Ammunition WWII store			

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1258	MON	Bank to ?contain blast.			
TR 36 NW 1259	MON	Bank to ?contain blast.			
TR 36 NW 1260	MON	2013 extant ?CHLradio tower .			
TR 36 NW 1261	MON	Possible Klein-kampfanlage shown on 11.1940 Luftwaffe map.			
TR 36 NW 1262	MON	Possible Klein-kampfanlage shown on 11.1940 Luftwaffe map			
TR 36 NW 1263	MON	Klein-kampfanlage shown on 11.1940 Luftwaffe map.			
TR 36 NW 1264	MON	'Munitions dump' shown on 11.1940 Luftwaffe map.			
TR 36 NW 1265	MON	hidden auxiliary base			
TR 36 NW 132	MON	Undated enclosure, Margate	Site		
TR 36 NW 133	MON	Enclosure	Enclosure		
TR 36 NW 134	MON	Possible post-medieval field boundary	Field boundary	1540 AD to 1900 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 135	MON	Possible post-medieval field boundary	Field boundary	1540 AD to 1900 AD	Post Medieval
TR 36 NW 136	MON	Undated enclosures, margate	Enclosure		
TR 36 NW 137	MON	Possible barrow site, near Vincent Farm, Margate	Barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 138	MON	Enclosure	Enclosure		
TR 36 NW 139	MON	Undated ring ditch, margate	Ring ditch		
TR 36 NW 15	MON	Caves of uncertain origin, Cheeseman's Farm and Alland Grange, Acol and Minster	Cave, air raid shelter	1914 AD to 1918 AD	Modern
TR 36 NW 16	MON	Cheeseman's Camp enclosure, Cheeseman's Farm, Minster and Acol parishes	Enclosure		
TR 36 NW 166	MON	Goalpost enclosures, Monkton and Acol parishes	Enclosure, pit		
TR 36 NW 168	MON	Double ditch and pit cropmarks, Monkton parish	Sub circular enclosure, pit		
TR 36 NW 169	MON	Cropmark of possible Bronze Age round barrow, Acol	Barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 170	MON	Ring ditch and pit cropmarks, near Cheeseman's Farm, Acol	Pit, ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 171	MON	Enclosure cropmark, near Rose Farm, Minster parish	Goal post enclosure		
TR 36 NW 172	MON	Ring ditch cropmarks, Minster, Thanet	Barrow, ring ditch, pit?	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 173	MON	Trackway cropmarks, Minster	Trackway		
TR 36 NW 174	MON	Ring ditch cropmark, Minster	Ring ditch		
TR 36 NW 175	MON	Ring ditch and barrow cropmarks, near Mill House Hospital, Minster	Ring ditch		
TR 36 NW 176	MON	Ring ditch cropmark (possible barrow), Cottage Hill, Minster	Ring ditch		
TR 36 NW 177	MON	Late Neolithic/Early Bronze Age ditched enclosure, Laundry Road, Minster	Settlement, ditched enclosure	3000 BC to 1001 BC	Late Neolithic to Middle Bronze Age
TR 36 NW 178	MON	Barrow enclosure cropmark, Minster, Thanet	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 179	MON	Sub circular cropmark (possible barrow), Minster, Thanet	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 18	MON	Chalk cut chamber, Acol Farm	Chalk pit?, dene hole?		
TR 36 NW 180	MON	Ring ditch cropmark, Manston	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 181	MON	Iron Age ditch, Minster	Ditch	800 BC to 42 AD	Iron Age
TR 36 NW 182	MON	Roman-British industrial/settlement site, Minster	Industrial site, pit, settlement	43 AD to 399 AD	Roman
TR 36 NW 183	FS	Romano-British finds, near Manston Airport, Minster	Findspot	100 BC to 409 AD	Late Iron Age to Roman
TR 36 NW 184	MON	Romano-British surface and associated finds, near the A253, Minster	Iron working site	43 AD to 409 AD	Roman
TR 36 NW 185	MON	Iron Age occupation site, Minster	Settlement, pit, ditch	800 BC to 42 AD	Iron Age
TR 36 NW 186	MON	Early medieval burials, near the A253, Minster	Inhumation cemetery	575 AD to 650 AD	Early Medieval or Anglo-Saxon
TR 36 NW 187	MON	Romano-British cemetery, near the A253, Minster	Cemetery	43 AD to 199 AD	Roman
TR 36 NW 188	MON	Romano-British ditch, near A253, Minster	Ditch	43 AD to 409 AD	Roman
TR 36 NW 189	MON	Female inhumation burial, near A253, Minster	Inhumation	200 AD to 1065 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NW 190	MON	Iron Age settlement, near A253, Manston	Settlement, pit	800 BC to 42 AD	Iron Age
TR 36 NW 192	FS	Iron arrow barb fragments, Minster	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 193	FS	Bronze blade and fragments, near A253, Minster	Hoard	2350 BC to 701 BC	Bronze Age
TR 36 NW 195	MON	Early medieval inhumations, near A253, Minster	Cemetery	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 208	MON	Enclosure cropmark, Mount Pleasant, Minster	Enclosure		
TR 36 NW 209	MON	Roman industrial/occupation site, Minster	Settlement, bloomery	43 AD to 409 AD	Roman
TR 36 NW 210	MON	Enclosure and round barrow cropmarks, near Manston Airport, Minster	Barrow, enclosure	4000 BC to 1065 AD	Early Neolithic to Early Medieval or Anglo-Saxon
TR 36 NW 211	MON	Enclosure soilmark, Monkton parish	Enclosure		
TR 36 NW 212	FS	Romano-British pottery, Cleve Court, Monkton	Findspot	43 AD to 409 AD	Roman
TR 36 NW 214	MON	Barrow and linear feature cropmarks, near Mount Pleasant, Minster, Thanet	Barrow, linear feature	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 215	MON	Inhumation burials, Minster Laundry Industrial Estate, Minster	Inhumation		
TR 36 NW 216	FS	Early-medieval bead and iron knife, near A253, Minster	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 218	MON	Undated inhumation burials, Minster	Inhumation		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 22	LB	REMAINS OF MONASTIC BUILDING, NOW OUTBUILDING	Site, first floor hall house, outbuilding, augustinian grange, first floor hall house, augustinian grange	1215 AD to 1799 AD	Medieval to Post Medieval
TR 36 NW 220	FS	Belgic pottery	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 221	FS	Romano-British pottery	Findspot	43 AD to 409 AD	Roman
TR 36 NW 222	MON	Denehole, Plumstone road, Monkton parish	Dene hole	43 AD to 409 AD	Roman
TR 36 NW 224	FS	Celtic coin, Acol	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 225	FS	Iron Age pottery, near Cleve Court, Monkton parish	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 226	MON	Bronze Age/early Iron Age settlement, near Pouces Cottages, Minster	Settlement	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NW 228	MON	Manston grange farm	Barn, barn	1540 AD to 1900 AD	Post Medieval
TR 36 NW 229	LB	MANSTON COURT AND WALL ADJACENT	Site, house, wall	1853 AD to 2050 AD	Post Medieval to Modern
TR 36 NW 233	MON	Ring ditch cropmark, Plumstone Farm, Monkton	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 234	MON	Ring ditch cropmark, near Vincent Farm, Ramsgate	Ring ditch		
TR 36 NW 237	MON	Undated maculas and pits, near Plumstone Farm, Monkton	Macula, pit		
TR 36 NW 238	MON	Romano-British settlement, Minster parish	Shrine, hollow way, enclosure, well	43 AD to 409 AD	Roman
TR 36 NW 239	MON	Romano British features, Minster parish	Granary, hollow way, enclosure, pit, post hole	175 AD to 409 AD	Roman
TR 36 NW 240	MON	Anglo-Saxon cemetery, hollow way and ditch, Minster parish	Cemetery, hollow way, ditch	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 241	MON	Macula cropmark feature, possible barrow, Dellside, Minster, Thanet	Macula, barrow?	2350 BC to 701 BC	Bronze Age
TR 36 NW 242	MON	Ring ditch cropmark, Manston Park, Acol	Ring ditch		
TR 36 NW 243	MON	Macula cropmark feature, possible Neolithic long barrow, Ramsgate	Macula, long barrow?	4000 BC to 2351 BC	Neolithic
TR 36 NW 244	MON	Ring ditch cropmark feature, Manston aerodrome, Minster	Ring ditch		
TR 36 NW 245	MON	Ring ditch cropmark, Manston Aerodrome, Minster	Ring ditch		
TR 36 NW 246	MON	Medieval Farmstead, Manston, Thanet	Farmstead, timber framed building, enclosure	1200 AD to 1375 AD	Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 249	MON	Ring ditch cropmark feature, Laundry Road, Minster	Ring ditch		
TR 36 NW 251	MON	Ring ditch and enclosure cropmarks, Kent International Business Park, Acol	Enclosure, ring ditch, henge?	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NW 252	MON	Three ring ditches, Cleve Court, Monkton	Ring ditch		
TR 36 NW 253	MON	Ring ditch cropmark and possible trackway, Kent International Business Park	Round barrow, trackway	2350 BC to 701 BC	Bronze Age
TR 36 NW 254	MON	Medieval farmstead enclosure, Kent International Business Park, Acol	Farmstead, enclosure, grubenhaus	1150 AD to 1250 AD	Medieval
TR 36 NW 255	MON	Enclosure cropmark, Kent International Business Park, Acol	Enclosure	43 AD to 1539 AD	Roman to Medieval
TR 36 NW 256	MON	Cropmark of Bronze Age round barrow, Manston, Minster	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 257	MON	Cropmarks of ring ditches and trackway, Acol	Trackway, ring ditch		
TR 36 NW 258	MON	Possible Kiln base, Cleve Court, Monkton parish	Kiln?		
TR 36 NW 259	MON	Undated ditch and pit, Manston	Ditch, pit		
TR 36 NW 26	FS	Iron Age coins found at an unknown location on the Isle of Thanet	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 260	CRA	Douglas Havoc Mark I BB893	Aircraft crash site, douglas	1940 AD to 1941 AD	Modern
TR 36 NW 27	MON	Late 1st century/early 2nd century Romano-British cremations, Minster	Cremation	43 AD to 409 AD	Roman
TR 36 NW 28	FS	Roman coin hoard, Mount Pleasant, Minster	Findspot	43 AD to 409 AD	Roman
TR 36 NW 301	MON	Prehistoric pit/ditch, Mount Pleasant, Minster parish	Feature	800 BC to 42 AD	Iron Age
TR 36 NW 306	MON	Goal post enclosure and linear cropmarks, Mount Pleasant, Minster	Enclosure, linear feature, pit		
TR 36 NW 308	MON	Ring ditch cropmark, Mount Pleasant	Ring ditch		
TR 36 NW 324	MON	Post medieval Icehouse, Cleve Court	Icehouse	1861 AD to 1940 AD	Post Medieval to Modern
TR 36 NW 327	MON	Freehold chalk pit, Minster	Chalk pit	1540 AD to 1896 AD	Post Medieval
TR 36 NW 328	MON	Dellside chalk pit, Minster	Chalk pit	1540 AD to 1896 AD	Post Medieval
TR 36 NW 329	MON	Way chalk pit, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 NW 331	MON	Thorne Hill chalk pit, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 332	BLD	One man air raid shelter, near the Spitfire Memorial, Manston	Air raid shelter	1939 AD to 1945 AD	Modern
TR 36 NW 335	MON	Cheeseman Farm caves chalk pit, Acol	Chalk pit	1540 AD to 1861 AD	Post Medieval
TR 36 NW 336	MON	Chalkpits at Cheeseman's Farm, Minster and Acol parishes	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 NW 337	MON	Mount Pleasant chalk pit, Minster parish	Chalk pit, lime kiln	1540 AD to 1931 AD	Post Medieval to Modern
TR 36 NW 34	MON	Site of barrow, near Cliffs End, Minster parish	Round barrow, burial	2350 BC to 701 BC	Bronze Age
TR 36 NW 342	MON	Old chalk pit, near Vincent Farm, Margate	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NW 35	MON	Early Iron Age pits, near Cliffs End, Minster parish	Pit	800 BC to 401 BC	Early Iron Age
TR 36 NW 356	MON	Round barrow, Kent International Business Park, Acol	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 357	MON	Shallow depression (possible Bronze Age pond barrow?), Acol	Hollow		
TR 36 NW 359	MON	Iron Age enclosure at Kent International Business Park, Acol	Pit, ditch, enclosure, farmstead	50 BC to 42 AD	Late Iron Age
TR 36 NW 361	MON	Undated ring ditch, near Plumstone Farm, Monkton	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 368	MON	Iron Age pits at Manston	Pit	800 BC to 101 BC	Early Iron Age to Middle Iron Age
TR 36 NW 369	MON	Romano-British or later pits at Manston	Pit	43 AD to 409 AD	Roman
TR 36 NW 373	MON	Cropmark complex in Manston Airfield, Minster parish	Enclosure, linear system		
TR 36 NW 376	MON	Ring ditch and macula cropmark features, Monkton	Macula, ring ditch, pit		
TR 36 NW 377	MON	Undated cropmark features, near Plumstone Farm, Monkton	Barrow, linear feature, ring ditch, pit defined enclosure	2350 BC to 701 BC	Bronze Age
TR 36 NW 378	MON	Linear cropmark system near alland grange	Linear system		
TR 36 NW 379	MON	Ap linear feature	Linear feature		
TR 36 NW 380	MON	Ring ditch cropmark, Mill House Hospital, Minster	Ring ditch		
TR 36 NW 381	MON	Ring ditch cropmark feature, Mill House Hospital, Minster	Ring ditch		
TR 36 NW 382	MON	Iron Age pit, Laundry Road, Minster parish	Pit	800 BC to 101 BC	Early Iron Age to Middle Iron Age
TR 36 NW 383	MON	Early medieval burial(s?) and pit, Laundry Road, Minster	Pit?, inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 384	MON	Unidentified pit, near Manston Airport, Minster parish	Pit?, ditch?		
TR 36 NW 385	FS	Elizabethan coin found near Cheeseman's Farm, Minster	Findspot	1558 AD to 1603 AD	Post Medieval
TR 36 NW 386	FS	Romano-Britsh pottery sherds and tile fragments, near Manston Park, Minster parish	Findspot	43 AD to 409 AD	Roman
TR 36 NW 389	MON	Prehistoric pits, near Cleve Court, Manston	Midden, cremation?, pit?	4000 BC to 42 AD	Later Prehistoric
TR 36 NW 39	MON	Probable Bronze Age barrows, near Mount Pleasant, Minster parish	Ring ditch, rectangular enclosure	2350 BC to 701 BC	Bronze Age
TR 36 NW 390	FS	Bronze Age spearhead, near Cleve Court, Manston	Findspot	1000 BC to 701 BC	Late Bronze Age
TR 36 NW 391	FS	Bronze Age axehead, near Cleve Court, Manston	Findspot	1600 BC to 701 BC	Middle Bronze Age to Late Bronze Age
TR 36 NW 392	FS	Early medieval beads, near Cleve Court, Manston	Findspot	410 AD to 800 AD	Early Medieval or Anglo-Saxon
TR 36 NW 393	MON	Iron Age features, near Cleve Court, Manston	Ditch, pit	800 BC to 42 AD	Iron Age
TR 36 NW 395	MON	Late Neolithic/early Bronze Age features, Kent International Business Park, Acol	Pit?, site?	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 NW 396	MON	Middle Bronze Age ditch and pit, Kent International Business Park, Acol	Site, ditch, pit	1600 BC to 1001 BC	Middle Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 397	MON	Possible Neolithic/early Bronze Age site, Manston, Acol	Ditch, pit	4000 BC to 1501 BC	Early Neolithic to Early Bronze Age
TR 36 NW 398	MON	World War II slit trench, Kent International Business Park, Monkton and Acol parishes	Slit trench	1939 AD to 1945 AD	Modern
TR 36 NW 399	MON	Site of an RAF bombing range, Kent International Business Park, Monkton and Acol parishes	Bombing range	1918 AD to 1939 AD	Modern
TR 36 NW 401	MON	Undated ring ditch, north of Manston Airport, Minster parish	Ring ditch		
TR 36 NW 405	FS	Coin of Charles I found near Cheeseman's Farm, Minster	Findspot	1625 AD to 1649 AD	Post Medieval
TR 36 NW 432	MON	Manston military and civil aviation airfield	Airfield	1916 AD	Modern
TR 36 NW 435	MON	Field Boundary of Probable Bronze Age date, and prehistoric flints, Manston Park Bungalows	Field boundary?	2350 BC to 701 BC	Bronze Age
TR 36 NW 437	MON	Manston Caves, a mid 18th century chalk mine	Chalk pit	1740 AD to 1780 AD	Post Medieval
TR 36 NW 439	FS	Prehistoric flints, St. Catherine's Grove, Manston	Findspot	7000 BC to 701 BC	Late Mesolithic to Late Bronze Age
TR 36 NW 447	MON	Cropmarks of enclosures and a trackway, west of Manston	Rectilinear enclosure, trackway, field system, linear feature		
TR 36 NW 448	MON	Cropmark of a ring ditch, west of Manston	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 450	MON	Possible Roman pits, improvements to the A253 west of Minster	Pit	43 AD to 409 AD	Roman
TR 36 NW 451	MON	Undated ditches/possible ditches, improvements to the A253 west of Minster	Ditch		
TR 36 NW 452	MON	Undated pallisade trench or wall foundation, improvements to A253 west of Minster	Palisade ditch?		
TR 36 NW 453	MON	Later Prehistoric post holes, improvements on the A253 west of Minster	Post hole		
TR 36 NW 454	MON	Bronze Age burial, improvement to the A253 west of Minster	Human remains, crouched inhumation	2350 BC to 1501 BC	Early Bronze Age
TR 36 NW 455	MON	Part of Anglo-Saxon sunken featured building, improvements on A253 west of Minster	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 456	MON	Ring ditches, pits, and linear features	Ring ditch, barrow cemetery?, pit, linear feature, enclosure, grubenhaus?		
TR 36 NW 457	MON	Goalpost enclosures, Monkton and Acol parishes	Enclosure		
TR 36 NW 461	MON	Irregular enclosure, south of Westbrook	Enclosure		
TR 36 NW 466	MON	Bronze Age ditch, Manston Airport	Ditch	1200 BC to 900 BC	Middle Bronze Age to Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 467	MON	Roman pit, Manston Airport	Pit, hearth	50 AD to 150 AD	Roman
TR 36 NW 468	MON	Medieval occupation, Manston Airport	Ditch, pit, demolition debris	1100 AD to 1300 AD	Medieval
TR 36 NW 469	FS	Early Iron Age to Roman pottery, Manston Airport	Findspot	800 BC to 200 AD	Early Iron Age to Roman
TR 36 NW 470	FS	Late Bronze Age to Early Iron Age pottery, Manston Airport	Findspot	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NW 471	FS	Mid Saxon to medieval pottery, Manston Airport	Findspot	800 AD to 1539 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NW 474	MON	Anglo-Saxon Sunken Featured Building, Queensdown Riding and Livery Centre	Grubenhaus, pit, ditch, post hole	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 475	MON	A possibly Late Iron Age pit, Queensdown Riding and Livery Centre	Pit	800 BC to 42 AD	Iron Age
TR 36 NW 476	MON	Roman ditch, Woodchurch	Ditch	75 AD to 125 AD	Roman
TR 36 NW 477	MON	Bronze Age ditch and post holes, The Hanger, The Loop, Manston	Ditch, post hole	2350 BC to 701 BC	Bronze Age
TR 36 NW 481	MON	Medieval quarry, Grove Farm, Manston	Quarry	1375 AD to 1600 AD	Medieval to Post Medieval
TR 36 NW 482	MON	Neolithic pit and pottery, Tothill Street, Minster	Pit	4000 BC to 2351 BC	Neolithic

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 483	MON	Bronze Age round barrow, Tothill Street, Minster	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 484	MON	Iron Age settlement, Tothill Street, Minster	Pit, ditch, inhumation, post alignment, quarry	400 BC to 42 AD	Middle Iron Age to Late Iron Age
TR 36 NW 485	FS	Roman pottery, Tothill Street, Minster	Findspot	43 AD to 409 AD	Roman
TR 36 NW 486	MON	Probable Second World War structure, Tothill Street, Minster	Structure	1939 AD to 1945 AD	Modern
TR 36 NW 487	FS	Bronze age flints, Manston Court Road, Manston	Findspot	2350 BC to 701 BC	Bronze Age
TR 36 NW 488	MON	Possible Roman post holes, Manston Court Road, Manston	Post hole	43 AD to 409 AD	Roman
TR 36 NW 489	MON	Palaeolithic worked flints, The Loop, Manston	Lithic working site	C	Middle Palaeolithic
TR 36 NW 490	MON	Late Iron Age post holes, Manston	Post hole	100 BC to 42 AD	Late Iron Age
TR 36 NW 494	MON	Undated ditch, Bradgate Caravan Park	Ditch		
TR 36 NW 495	MON	An undated ditch, Woodchurch Road	Ditch		
TR 36 NW 498	FS	Anglo-Saxon silver early penny ('sceat'), Manston	Findspot	715 AD to 720 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 499	FS	Merovingian gold tremissis, Manston	Findspot	500 AD to 675 AD	Early Medieval or Anglo-Saxon
TR 36 NW 50	FS	Roman occupation site and associated finds, near Manston airport, Minster parish	Findspot, ditch, hollow	50 AD to 150 AD	Roman
TR 36 NW 500	MON	Middle Bronze Age-Late Bronze Age occupation, Tothill Street	Enclosure, ditch, post built structure, round house (domestic)	1600 BC to 701 BC	Middle Bronze Age to Late Bronze Age
TR 36 NW 501	MON	Late Iron Age-Roman occupation, Tothill Street	Ditch, grubenhaus, extended inhumation, post hole	100 BC to 175 AD	Late Iron Age to Roman
TR 36 NW 502	MON	Middle Bronze Age enclosures, The Loop, Manston	Pit, trackway, enclosure, post hole, waterhole, settlement?, double ditched enclosure?	2350 BC to 1001 BC	Early Bronze Age to Middle Bronze Age
TR 36 NW 503	MON	Medieval gully, The Loop, Manston	Gully	1200 AD to 1300 AD	Medieval
TR 36 NW 504	FS	Mesolithic/Early Neolithic flints, The Loop	Findspot	10000 BC to 3001 BC	Early Mesolithic to Early Neolithic
TR 36 NW 506	CRA	Crash site of Heinkel He111H-2	Aircraft crash site, he111	1940 AD	Modern
TR 36 NW 507	CRA	Crash site of Hawker Typhoon IB	Aircraft crash site, typhoon	1943 AD	Modern
TR 36 NW 508	CRA	Crash site of Hawker Typhoon IB	Aircraft crash site, typhoon	1943 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 509	CRA	Crash site of Consolidated B24J Liberator	Aircraft crash site, b24 liberator	1944 AD	Modern
TR 36 NW 510	CRA	Crash site of Consolidated B24H Liberator	Aircraft crash site, b24 liberator	1944 AD	Modern
TR 36 NW 512	CRA	Crash site of Bristol Blenheim	Aircraft crash site, blenheim	1940 AD	Modern
TR 36 NW 513	MON	An undated trackway, Manston	Trackway		
TR 36 NW 518	MON	Second World War air raid shelter, Manston Airport	Air raid shelter	1940 AD to 2050 AD	Modern
TR 36 NW 522	LB	WAYBOROUGH MANOR	House, site, jettied house, jettied house, courtyard, arch	1066 AD to 1599 AD	Medieval to Post Medieval
TR 36 NW 529	MON	Possible ring ditch, Thorne Farm, Ramsgate	Ring ditch?		
TR 36 NW 530	MON	Possible ring ditch, Thorne Farm, Ramsgate	Ring ditch?		
TR 36 NW 531	FS	Roman pottery, Thorne Farm, Ramsgate	Findspot	43 AD to 409 AD	Roman
TR 36 NW 532	FS	Medieval pottery and peg tile, Thorne Farm, Ramsgate	Findspot	1066 AD to 1539 AD	Medieval
TR 36 NW 533	MON	Cropmark of a ring ditch, to the north east of Minster	Ring ditch		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 534	MON	Cropmark of a ring ditch, north of Minster	Ring ditch		
TR 36 NW 535	MON	Cropmark of a ring ditch, south of Manston near A253			
TR 36 NW 536	MON	Cropmark of a ring ditch, south of Manston near the A253	Ring ditch		
TR 36 NW 537	MON	Cropmark of a ring ditch, north of Cleve Court Farm near Acol			
TR 36 NW 538	MON	Cropmark of a ring ditch, North of Cleve Court Farm, near Acol	Ring ditch		
TR 36 NW 539	MON	Cropmark of a rectilinear enclosure, north of Cleve Court Farm near Acol	Rectilinear enclosure		
TR 36 NW 543	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 544	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 545	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 546	FS	East Kent Access route: Palaeolithic flake, found during excavations	Findspot	C	Palaeolithic
TR 36 NW 547	MON	Features identified by geophysical survey on the site of a proposed solar farm at Manston Airfield	Site		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 547	MON	Features identified by geophysical survey on the site of a proposed solar farm at Manston Airfield	Site		
TR 36 NW 55	FS	Palaeolithic flint implement, surface find from Telegraph Hill, Minster, Thanet	Findspot	500000 BC to 40001 B	Lower Palaeolithic to Middle Palaeolithic
TR 36 NW 551	FS	Flint flake and pleistocene geological sequence, The Loop, Manston			
TR 36 NW 551	FS	Flint flake and pleistocene geological sequence, The Loop, Manston			
TR 36 NW 666	BLD	Second World War semi-sunken brick building, located on Windsor Road.	Building	1944 AD to 2050 AD	Modern
TR 36 NW 71	MON	Possible post-medieval field boundary, in fields near Vincent Farm, Margate	Field boundary?	1540 AD to 1900 AD	Post Medieval
TR 36 NW 72	MON	Cropmarks of possible graves, near Monkton Road, Margate	Grave?		
TR 36 NW 80	MON	Cropmarks of enclosures, The Nook Hackthorn Farm, Margate	Enclosure		
TR 36 NW 81	MON	Ring ditch, Enclosure crop marks, Margate	Ring ditch, enclosure		
TR 36 NW 82	MON	Cropmarks of enclosure, Flete Farm, near Manston	Enclosure, ditch, pit	43 AD to 409 AD	Roman
TR 36 NW 83	MON	Cropmarks of enclosures, barrows & field systems, near Woodchurch	Enclosure		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 84	MON	Enclosure and barrow cropmarks, Minster, Thanet	Enclosure, barrow	4000 BC to 1065 AD	Early Neolithic to Early Medieval or Anglo-Saxon
TR 36 NW 85	MON	Bronze Age barrows, near Mount Pleasant, Minster, Thanet	Barrow, pit	2350 BC to 701 BC	Bronze Age
TR 36 NW 86	MON	Enclosure cropmarks, Mount Pleasant, Minster parish	Enclosure		
TR 36 NW 92	MON	Enclosure cropmark, Manston, Minster parish	Enclosure		
TR 36 SE 17	MON	Enclosure cropmark and sub circular feature, Ramsgate	Enclosure, grubenhaus?	4000 BC to 42 AD	Later Prehistoric
TR 36 SE 20	MON	Cropmark ring ditches, Ramsgate, Thanet	Ring ditch, ring ditch, barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 SE 21	MON	Ring ditch cropmarks, Ramsgate	Ring ditch		
TR 36 SE 210	MON	Early iron age pit discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 401 BC	Early Iron Age
TR 36 SE 22	MON	Ring ditch cropmarks, Ramsgate	Ring ditch		
TR 36 SE 23	MON	Ring ditch and possible Anglo-Saxon barrow, Ramsgate	Barrow, ring ditch, ring ditch	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 SE 25	MON	Area cropmark features, Ramsgate	Site		
TR 36 SE 26	MON	Medieval rems	Pit	1066 AD to 1539 AD	Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SE 31	MON	Slit trench cropmark, Ramsgate	Slit trench	1939 AD to 1945 AD	Modern
TR 36 SE 319	MON	Neolithic pit, Chalk Hill	Pit	4000 BC to 2351 BC	Neolithic
TR 36 SE 320	MON	Roman inhumation, Cliffsend	Inhumation	43 AD to 409 AD	Roman
TR 36 SE 336	MON	Possible location of Grubenhaus, Pegwell, near Ramsgate	Pit, grubenhaus		
TR 36 SE 342	MON	Late Neolithic/Early Bronze Age inhumation burial, Harbour Approach Road, Ramsgate	Crouched inhumation	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 SE 35	MON	Medieval well shaft	Well	1066 AD to 1539 AD	Medieval
TR 36 SE 37	FS	Romano-British coins brooch and key	Findspot	43 AD to 409 AD	Roman
TR 36 SE 42	MON	Probable Bronze Age barrow, Little Cliffs End, Ramsgate	Barrow, ring ditch, pit	2350 BC to 701 BC	Bronze Age
TR 36 SE 463	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 464	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 465	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 470	BLD	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 48	FS	Iron Age coin	Findspot	800 BC to 42 AD	Iron Age
TR 36 SE 483	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SE 572	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 659	MON	Roman features, Cliffsend	Pit, feature	43 AD to 409 AD	Roman
TR 36 SE 683	MON	Late Bronze Age/Early Iron Age pits and ditch/possible enclosure, Chalk Hill	Pit, enclosure?	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SE 685	MON	Late Iron Age feature, Chalk Hill	Feature	25 AD to 75 AD	Late Iron Age to Roman
TR 36 SE 686	MON	Anglo Saxon inhumation, Chalk Hill	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SE 687	MON	Two undated pits/post holes, Chalk Hill	Pit?		
TR 36 SE 688	MON	Remains of an undated ditch, Chalk Hill	Ditch?		
TR 36 SE 716	MON	Early medieval shell midden, Pegwell Bay	Shell midden, pit	670 AD to 910 AD	Early Medieval or Anglo-Saxon
TR 36 SE 720	MON	An undated feature with a shell midden, Cliffs End	Feature, shell midden		
TR 36 SE 733	MON	Amorphous cropmark of possible infilled chalk pit	Chalk pit?	1540 AD to 1860 AD	Post Medieval
TR 36 SE 735	MON	Parallel cropmarks of a curving linear feature with a possible bank and ditch encompassing features to the south	Linear feature		
TR 36 SE 737	MON	Neolithic pits containing struck flints and early neolithic pottery discovered during the East Kent Access Route excavations (2009-2011)	Pit	4000 BC to 3001 BC	Early Neolithic

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SE 738	MON	Late iron age enclosure and features discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, pit	100 BC to 42 AD	Late Iron Age
TR 36 SE 739	MON	Anglo-Saxon cemetery and pits discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, grave, pit, hearth	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SE 753	LB	Eastern of two Concrete Second World War 4-inch gun emplacements, Little Cliffsend Farm	Coast battery gun site	1940 AD to 2050 AD	Modern
TR 36 SE 754	BLD	Western 4-inch gun emplacement, Little Cliffsend Farm	Coast battery gun site	1940 AD to 2050 AD	Modern
TR 36 SW 100	FS	Neolithic flints, potin coins, prehsitoric pottery and Romano-British tiles, Abbey farm, Minster	Findspot	4000 BC to 409 AD	Early Neolithic to Roman
TR 36 SW 106	MON	Undated crouched inhumation burial, Cliffsend, Ramsgate	Crouched inhumation		
TR 36 SW 110	MON	Foxborough lane brickfield, Minster	Brickworks	1540 AD to 1908 AD	Post Medieval to Modern
TR 36 SW 111	MON	Site of Cliffsend Crossing chalk pit	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 SW 1123	MON	Possible ring-ditch, 50m diameter, north of Telegraph Hill	Ring ditch		
TR 36 SW 123	MON	Romano-British ditches, sunken featured building, two cemetries and pit containing prehistoric pottery	Ditch, pit, post hole, cremation cemetery, cremation cemetery	43 AD to 409 AD	Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 130	MON	Possible Bronze Age features, Cliffsend, Ramsgate	Ditch	900 BC to 600 BC	Late Bronze Age to Early Iron Age
TR 36 SW 134	MON	Six early Bronze Age round barrows, Cliffs End Farm	Round barrow, ring ditch, post built structure, inhumation?	2350 BC to 1501 BC	Early Bronze Age
TR 36 SW 137	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SW 138	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SW 162	LB	53 AND 55 FOAD'S LANE	Site, house, house	1736 AD to 1737 AD	Post Medieval
TR 36 SW 171	LB	ROSE COTTAGE	Site, end jetty house	1550 AD to 1699 AD	Post Medieval
TR 36 SW 179	LB	BAY TREE COTTAGE	Site, house, date stone, plaque	1745 AD to 1785 AD	Post Medieval
TR 36 SW 180	LB	ROSE COTTAGE AND PANSY COTTAGE	Site, house, laundry, bakehouse	1700 AD to 1732 AD	Post Medieval
TR 36 SW 182	LB	PSALM COTTAGE	Site, house	1800 AD to 1832 AD	Post Medieval
TR 36 SW 183	LB	CHAPEL HOUSE	Chapel, house, site, chapel, house, house, undercroft	1300 AD to 2007 AD	Medieval to Modern
TR 36 SW 224	MON	Prehistoric occupation site, Clive Road, Cliffsend	Post hole, round house (domestic)	4000 BC to 42 AD	Later Prehistoric

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 229	MON	Anglo-Saxon Cemetery and possible feasting site, Cliffs End Farm	Inhumation cemetery, pit, ditch, beam slot?	500 AD to 850 AD	Early Medieval or Anglo-Saxon
TR 36 SW 230	MON	Late bronze age enclosure and other features found at Cliffs End Farm.	Ditch, enclosure, midden, post hole, palisade?	1000 BC to 800 BC	Late Bronze Age
TR 36 SW 231	MON	Disused gasometer behind Mission Room	Gas holder	1897 AD	Post Medieval to Unknown
TR 36 SW 232	MON	Medieval ditch and pit, Cliffs End Farm	Ditch, pit, tree throw	1066 AD to 1539 AD	Medieval
TR 36 SW 235	MON	Prehistoric ditch, Cliffs End	Ditch, post hole?	4000 BC to 42 AD	Later Prehistoric
TR 36 SW 236	MON	Undated ditch terminal or pit, Cliffs End	Ditch?		
TR 36 SW 237	MON	Bronze Age features, Cliffs End	Ditch, pit?	2350 BC to 701 BC	Bronze Age
TR 36 SW 24	MON	Iron Age burials (found 1959)	Burial	800 BC to 42 AD	Iron Age
TR 36 SW 241	MON	Cropmarks of a curvilinear feature and possible sub-rectangular enclosure, north of Cliffs End	Linear feature, subrectangular enclosure?		
TR 36 SW 279	CRA	ME109	Aircraft crash site, me109	1939 AD to 1945 AD	Modern
TR 36 SW 282	MON	Late Bronze Age/Iron Age ritual and mortuary site, Cliffs End Farm	Crouched inhumation, pit, enclosure, quarry?, funerary enclosure?, post hole, cremation	1600 BC to 101 BC	Middle Bronze Age to Middle Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 288	FS	Bronze Age artefacts, Abbey Farm	Findspot	2350 BC to 701 BC	Bronze Age
TR 36 SW 289	MON	Thorne Farm chalk pit, near Cliffs End, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 SW 290	MON	Possible ring ditch, north of Cliffs End	Ring ditch?		
TR 36 SW 291	MON	Ring ditch, north of Cliffs End	Ring ditch		
TR 36 SW 292	MON	Possible ring ditch, north of Cliffs End	Ring ditch?		
TR 36 SW 297	MON	Ovate ring cropmark Minster	Feature		
TR 36 SW 297	MON	Possible circular cropmark, Thorne Cottages, Minster	Feature		
TR 36 SW 304	MON	Cropmark of sub-rectilinear ditched enclosure , c. 50 x 35m, east of Cliffsend Farm Cottages	Enclosure		
TR 36 SW 310	MON	Ditch visible as a cropmark topping a shallow rise	Ditch?		
TR 36 SW 312	MON	Cropmark shows rectangular enclosure with causeway entrance	Enclosure		
TR 36 SW 313	MON	Cropmark of a probable chalk pit, east of Thorne Farm	Chalk pit?		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 314	MON	Cropmark of a probable small chalk pit, east of Thorne Farm	Chalk pit?		
TR 36 SW 317	MON	6 possible pits defined as cropmarks, located between Thorne Farm and St Augustine's Golf Course	Pit		
TR 36 SW 318	MON	Crop-mark anomaly suggesting area of disturbance on southern side of Thorne Farm	Feature		
TR 36 SW 323	MON	Curving cropmark probably defining an ovate ditched enclosure but NW side is not visible	Curvilinear enclosure		
TR 36 SW 326	MON	Cropmark indicating a ditch or gully that appears to define a trapezoidal enclosure located north of Cliffsend Farm Cottages	Ditch		
TR 36 SW 328	MON	Partial cropmark of a probable ring-ditch	Ring ditch	1540 AD to 1860 AD	Post Medieval
TR 36 SW 329	MON	Possible structure platform, Red Cottages, Minster	Building platform?		
TR 36 SW 33	MON	Bronze Age enclosure and ring ditch	Ditch, circular enclosure	2350 BC to 701 BC	Bronze Age
TR 36 SW 35	MON	Crouched Inhumation, Cliffs End	Crouched inhumation	2350 BC to 1501 BC	Early Bronze Age
TR 36 SW 361	MON	Neolithic activity north of Great Cliffsend Farm, discovered during East Kent Access Route excavations 2009-2011, zone 9	Pit, enclosure	4000 BC to 701 BC	Early Neolithic to Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 362	MON	Late bronze age well with possible wattle lining, discovered during East Kent Access Route excavations 2009-2011, zone 9	Well?	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SW 365	LND	Large palaeochannel discovered during the East Kent Access Route excavations (2009-2011)	Palaeochannel	500000 BC to 42 AD	Prehistoric
TR 36 SW 366	MON	Mesolithic tranchet axe discovered during the East Kent Access Route excavations (2009-2011)	Findspot	10000 BC to 4001 BC	Mesolithic
TR 36 SW 367	MON	Bronze Age activity discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, cremation burial	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 367	MON	Bronze Age activity discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, cremation burial	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 367	MON	Iron Age ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 371	MON	Anglo-Saxon sunken featured buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 371	MON	Anglo-Saxon sunken featured buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 372	MON	Medieval ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	1066 AD to 1539 AD	Medieval
TR 36 SW 373	FS	Small assemblage of residual early prehistoric finds discovered during the East Kent Access Route excavations (2009-2011)	Findspot	4000 BC to 701 BC	Early Neolithic to Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 374	FS	Small bronze age agricultural settlement discovered during the East Kent Access Route excavations (2009-2011)	Gully, pit, ditch, cremation burial, cenotaph?	2350 BC to 701 BC	Bronze Age
TR 36 SW 374	MON	Middle to late iron age settlement discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, gully	400 BC to 42 AD	Middle Iron Age to Late Iron Age
TR 36 SW 376	MON	Middle to late iron age settlement discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, gully, post hole, hollow way	800 BC to 42 AD	Iron Age
TR 36 SW 377	MON	Romano-British burials and cremations discovered during the East Kent Access Route excavations (2009-2011)	Inhumation, cremation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 SW 378	MON	Romano-British ditches and hollow way discovered during the East Kent Access Route excavations (2009-2011)	Hollow way, ditch, pit	800 BC to 409 AD	Early Iron Age to Roman
TR 36 SW 379	MON	Bronze Age double ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 SW 380	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 SW 382	MON	Prehistoric palisade, discovered during the East Kent Access Route excavations (2009-2011)	Palisade	2350 BC to 101 BC	Early Bronze Age to Middle Iron Age
TR 36 SW 384	MON	Middle iron age pits, trapezoidal enclosure, sunken feature building discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, grubenhaus, pit, post built structure, post hole	400 BC to 101 BC	Middle Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 385	MON	Middle iron age pits west of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit, post built structure, inhumation	400 BC to 101 BC	Middle Iron Age
TR 36 SW 385	MON	Middle iron age pits south of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit	400 BC to 101 BC	Middle Iron Age
TR 36 SW 386	MON	Middle iron age pits east of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit	400 BC to 101 BC	Middle Iron Age
TR 36 SW 387	MON	Middle iron age features north of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit, quarry, animal burial, fence?	400 BC to 101 BC	Middle Iron Age
TR 36 SW 388	MON	At least one Anglo-Saxon inhumation discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 389	MON	Early iron age pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 401 BC	Early Iron Age
TR 36 SW 390	MON	Roman sunken-featured buildings and pits discovered during the East Kent Access Route excavations (2009-2011)	Pit, grubenhaus, oven?, post hole, stake hole, ramp	400 BC to 409 AD	Middle Iron Age to Roman
TR 36 SW 390	MON	Roman sunken-featured buildings and pits discovered during the East Kent Access Route excavations (2009-2011)	Pit, grubenhaus, oven?, post hole, stake hole, ramp	400 BC to 409 AD	Middle Iron Age to Roman
TR 36 SW 391	MON	Post-medieval chalk quarry discovered during the East Kent Access Route excavations (2009-2011)	Quarry	1540 AD to 1900 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 393	MON	Late bronze age and early iron age ditches and D-shaped double-ditched enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, trackway, ditch	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SW 395	MON	Roman enclosures, pits and ditches discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, pit	43 AD to 409 AD	Roman
TR 36 SW 399	MON	Post-medieval chalk quarries discovered during the East Kent Access Route excavations (2009-2011)	Chalk pit	1801 AD to 1899 AD	Post Medieval
TR 36 SW 400	MON	Probable iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, field system?	800 BC to 42 AD	Iron Age
TR 36 SW 400	MON	Pit containing neolithic pottery discovered during the East Kent Access Route excavations (2009-2011)	Pit	4000 BC to 2351 BC	Neolithic
TR 36 SW 401	MON	Two small pits, each containing a middle bronze age pot, discovered during the East Kent Access Route excavations (2009-2011)	Pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 SW 402	MON	Middle bronze age to early iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Pit, ditch, field system	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 404	MON	Iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, field system, pit, trackway	400 BC to 409 AD	Middle Iron Age to Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 405	MON	Roman ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	43 AD to 409 AD	Roman
TR 36 SW 405	MON	Roman ditches, gullies, pits and cremations discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, pit, cremation	43 AD to 409 AD	Roman
TR 36 SW 406	MON	Late bronze age enclosure - the 'Central enclosure', Cliffs End Farm	Enclosure, pit, ditch	1000 BC to 800 BC	Late Bronze Age
TR 36 SW 407	MON	Late bronze age enclosure - the 'southern enclosure', Cliffs End Farm	Enclosure	1000 BC to 800 BC	Late Bronze Age
TR 36 SW 408	MON	Probable Second World War concrete slab, part of an anti-aircraft battery, Cliffs End Farm	Anti aircraft gun emplacement?	1939 AD to 1945 AD	Modern
TR 36 SW 58	MON	Prehistoric barrows, enclosures etc found north of Bethlehem Farm, Minster, Thanet	Barrow, enclosure, henge?, farmstead?, field system, inhumation, ditch, pit	4000 BC to 42 AD	Later Prehistoric
TR 36 SW 88	MON	Ring ditch cropmark, Minster	Ring ditch		
TR 36 SW 97	MON	Rectilinear cropmark enclosure, Thorne hill, Minster	Rectilinear enclosure, linear feature, pit		
TR 36 SW 99	MON	Undated archaeological features, Beech Grove, Ramsgate	Ditch, pit, post hole, hearth		
TR36 NW 1248	MON	?Ammunition WWII store			

Table B.2 Historic Environment Record: Events

Event ID	Record Type	Name	Organisation	Date	Event type
EKE3995	EVT	Thanet Gas Pipeline, Phase 1	Site owner	1971	Excavation
EKE3995	EVT	Thanet Gas Pipeline, Phase 1	Site owner	1971	Excavation
EKE4847	INT	Desk based assessment of the Kent International Business Park	Trust for Thanet Archaeology	1996	Desk based assessment
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE13405	INT	Margate and Broadstairs Urban Wastewater Treatment Scheme excavation phase	Wessex archaeology	2005/6	Excavation

Event ID	Record Type	Name	Organisation	Date	Event type
EKE13406	INT	Watching brief during pipe installation, Margate to Broadstairs (2005)	Wessex archaeology	2005	Excavation
EKE15385	INT	Watching brief conducted at Crabapple Farm Stables, Woodchurch Road, Birchington, Kent.	Trust for Thanet Archaeology	2016	
EKE13134	NON	Survey of a Second World War air raid shelter, Manston Airport	Kent underground research group	2004	Field survey
EKE5692	INT	Watching Brief on Margate & Broadstairs WTW Enhancement Scheme	Wessex archaeology	2000	Watching brief
EKE5692	INT	Watching Brief on Margate & Broadstairs WTW Enhancement Scheme	Wessex archaeology	2000	Watching brief
EKE8121	INT	Monkton to Mount Pleasant (A253 Duelling)	Canterbury archaeological trust	1994 - 1999	Excavation
EKE8121	INT	Monkton to Mount Pleasant (A253 Duelling)	Canterbury archaeological trust	1994 - 1999	Excavation
EKE8122	INT	Evaluation at Laundry Road, Minster	Isle of Thanet Archaeogical Unit	1995	Evaluation
EKE8123	INT	Excavation of a Beaker Burial From Manston	Isle of Thanet Archaeogical Unit	1987	Excavation
EKE12956	INT	Excavations of an Iron Age pit and a Roman cave, Spratling Court Farm chalk pit, Manston	Colin A. Baker	1996-2007	Excavation
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey

Event ID	Record Type	Name	Organisation	Date	Event type
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE8863	INT	Watching brief at Manston Court Farm, Manston, Thanet	Canterbury archaeological trust	2004	Watching brief
EKE13054	INT	Watching brief at Bradgate Caravan Park, Manston Court Road, near Manston	Trust for Thanet Archaeology	2010	Watching brief
EKE8342	INT	Evaluation on Land Adjacent to No.6 Laundry Road, Minster, Thanet	Trust for Thanet Archaeology	1996	Evaluation
EKE8386	INT	Chalk Hill palaeoenvironmental assessment (geotechnical survey)	Archaeoscape Consulting	1997	Borehole survey
EKE8388	INT	Excavation at Kent International Park, Manston 1997	Trust for Thanet Archaeology	1997	Excavation
EKE8420	INT	Evaluation at Ramsgate Harbour Approach Road, Ramsgate	Canterbury archaeological trust	1997	Evaluation
EKE13190	NON	Survey of features in the cliffface, Pegwell Bay	A j daniels	1992	Field survey
EKE12156	INT	Watching brief on land adjacent to Martrice, Windsor Road, Cliffsend	Trust for Thanet Archaeology	2012	Watching brief
EKE11465	INT	Geotechnical work at Manston Airport	Foundation and Exploration Services	1999	Geotechnical survey
EKE12183	NON	Desk based assessment of the proposed wind turbine installation at the Tesco Superstore, Manston	Trust for Thanet Archaeology	2008	Desk based assessment
EKE13950	INT	Erection of a detatched bungalow, land adjacent to Bay View, Windsor Road, Ramsgate, Kent	Trust for Thanet Archaeology	2014	Watching brief
EKE12141	INT	Watching brief on land adjacent to 19 Mount Green Avenue, Cliffsend	Trust for Thanet Archaeology	2007	Watching brief

Event ID	Record Type	Name	Organisation	Date	Event type
EKE11565	NON	Desk based assessment of Oaklands Nursery site, Cliffsend	Trust for Thanet Archaeology	1998	Desk based assessment
EKE11819	INT	Geotechnical survey at Westwood Industrial Estate, Manston Road, Ramsgate	Kent site investigation ltd	1993	Geotechnical survey
EKE11851	INT	Watching brief at Bradgate Caravan Park, Manston Court Road, Margate	Trust for Thanet Archaeology	2002	Watching brief
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey

Event ID	Record Type	Name	Organisation	Date	Event type
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE12049	NON	Desk based assessment of a proposed EDF Substation, Manston	Museum of London Archaeology	2004	Desk based assessment
EKE12055	NON	Survey of buildings at Grove Farm, Manston	Trust for Thanet Archaeology	2004	Building survey
EKE12117	NON	Desk based assessment of land at Spratling Court Farm, Spratling Street, Manston	Trust for Thanet Archaeology	2005	Desk based assessment
EKE12291	NON	Building survey of a pillbox on Manston Road allotments, Ramsgate	The historic environment consultancy	2007	Building survey
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief

Event ID	Record Type	Name	Organisation	Date	Event type
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12477	INT	Watching brief on an extension to the Reclamet Recycling Centre, Woodchurch Road, Woodchurch	Trust for Thanet Archaeology	2006	Watching brief
EKE12835	INT	Watching brief at Columbus Avenue, Manston Park	Swale and Thames Archaeological Survey Company		Watching brief, evaluation
EKE13030	INT	Watching brief of land south of Great West Autos, Manston Court Road, Ramsgate	Swale and Thames Archaeological Survey Company	2013	Watching brief
EKE13300	NON	Desk based assessment of Thorne Farm	Wardell armstrong consulting group	2013	Desk based assessment
EKE13537	NON	A256 East Kent Access Route, Desktop Assessment	Oxford archaeology	2003	
EKE14830	INT	Two palaeolithic test-pits excavated at The Loop, Manston, 2013	University of Southampton	2013	Test pit
EKE14830	INT	Two palaeolithic test-pits excavated at The Loop, Manston, 2013	University of Southampton	2013	Test pit

Event ID	Record Type	Name	Organisation	Date	Event type
EKE14878	INT	The Dump, Manston Road, Margate, Watching Brief	Trust for Thanet Archaeology		
EKE14991	NON	Little Cliffsend Farmhouse, Chalk Hill CT12 5HA, Statement of Heritage Significance	Architectural archaeology	2015	Building survey, desk based assessment

Appendix C Photos

Photo 1: View south-west towards the airfield from Manston High Street

Photo 2: View facing east towards the airfield from Prospect Inn

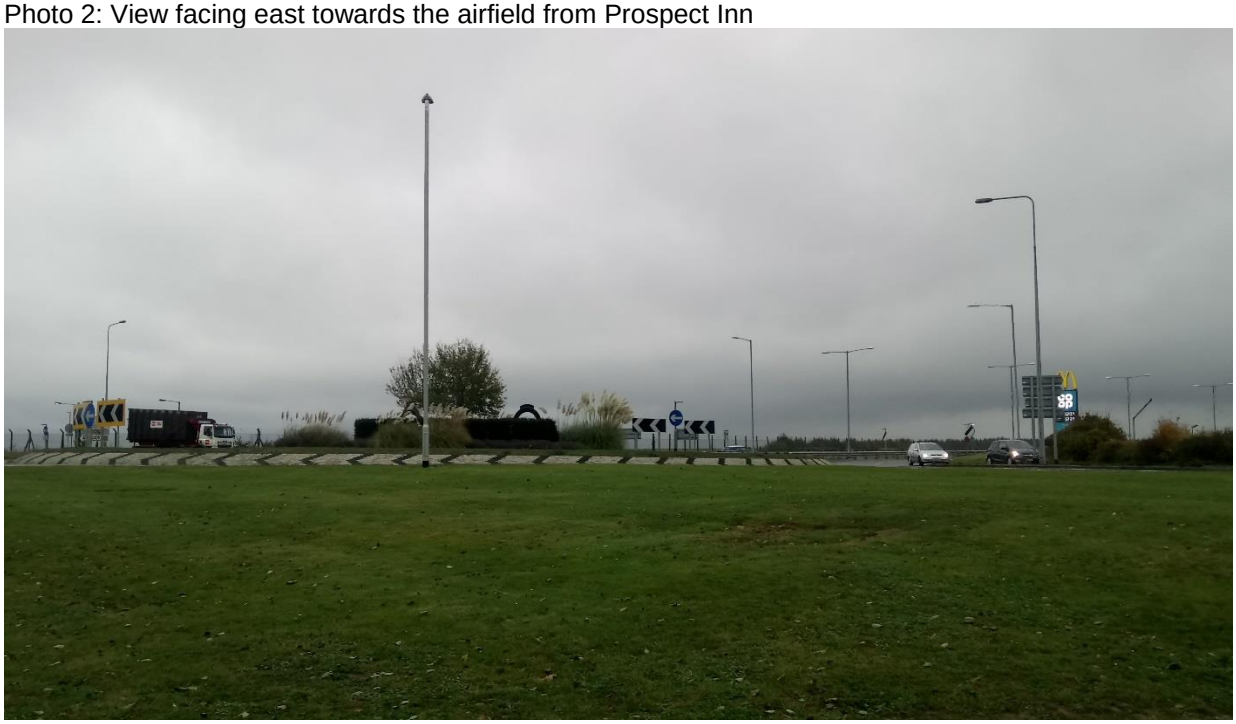

Photo 3: View of Minster High Street facing north from corner of Station Road and Church Street

Photo 4: View facing north towards the airfield from Richborough Castle

Appendix 9.2

Gazetteer of designated heritage assets within the study area

Listing ID	Name	Grade	Distance from site
1004203	Enclosure and ring ditches sited 180m east-northeast of Minster Laundry	SM	90m to south
1004228	Anglo-Saxon Cemetery south of Ozengell Grange	SM	100m to east
1224593	Wayborough Manor	II*	570m to south
1224683	Cleve Court and Cleave Lodge	II*	220m to north west
1336669	Barn about 50m east of Ozengell Grange	II*	430m to north east
1085377	Ozengell Grange	II	400m to north east
1085409	53 and 55 Foad's Lane	II	820m to south
1085442	Grove Farmhouse and Walled Front Garden	II	500m to east
1085443	Remains of Monastic Building	II	35m to east
1085444	Barn at Preston Farm	II	680m to east
1085445	Barn at Manston Green	II	450m to east
1204244	Flete Lodge	II	580m to north east
1223803	Cheeseman's Farm	II	760m to north
1224336	Chapel House	II	480m to south
1224337	Psalm Cottage	II	920m to south west
1224339	Rose Cottage and Pansy Cottage	II	675m to south
1224448	Prospect Inn	II	150m to west
1224499	Bay Tree Cottage	II	950m to south west
1224545	Tudor Cottage	II	660m to south
1266885	Rose Cottage	II	920m to south west
1266887	Way House and Wayborough House, and attached Garden Wall	II	350m to south
1336624	Old Forge House	II	480m to east
1336625	Manston Court and adjacent Wall	II	60m to east
1336626	Granary about 25m south of Manston Court Farmhouse	II	50m to east
1429581	Eastern of two Concrete WWII 4-inch gun emplacements	II	950m to south east
1430779	Manston War Memorial	II	445m to east

Appendix 9.3

Gazetteer of non-designated heritage assets (HER) within the study area

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE62996	FS	Medieval copper alloy brooch	Findspot	1100 AD to 1300 AD	Medieval
MKE65448	FS	Early Medieval copper alloy harness fitting	Findspot	1000 AD to 1100 AD	Early Medieval or Anglo-Saxon to Medieval
MKE73843	FS	Iron Age silver coin	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73868	FS	Iron Age copper alloy coin	Findspot	50 BC	Late Iron Age
MKE73869	FS	Iron Age copper alloy coin	Findspot	50 BC to 20 AD	Late Iron Age
MKE73875	FS	Iron Age copper alloy ring	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73915	FS	Iron Age copper alloy coin	Findspot	50 BC	Late Iron Age
MKE73917	FS	Iron Age silver coin	Findspot	50 BC	Late Iron Age
MKE73918	FS	Iron Age gold coin	Findspot	800 BC to 43 AD	Early Iron Age to Roman
MKE73920	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73921	FS	Iron Age copper alloy coin	Findspot	5 BC to 1 BC	Late Iron Age
MKE73922	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73923	FS	Iron Age copper alloy coin	Findspot	100 BC to 75 BC	Late Iron Age
MKE73924	FS	Iron Age copper alloy coin	Findspot	10 BC to 1 BC	Late Iron Age
MKE73951	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE73956	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE73958	FS	Medieval copper alloy weight	Findspot	1422 AD to 1475 AD	Medieval
MKE73959	FS	Iron Age copper alloy bow brooch	Findspot	100 BC to 43 AD	Late Iron Age to Roman
MKE73983	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73990	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73991	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73992	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73993	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE73994	FS	Iron Age copper alloy coin	Findspot	100 BC to 50 BC	Late Iron Age
MKE74000	FS	Medieval copper alloy brooch	Findspot	1066 AD to 1540 AD	Medieval to Post Medieval
MKE74003	FS	Iron Age copper alloy coin	Findspot	100 BC	Late Iron Age
MKE74029	FS	Iron Age copper alloy coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74041	FS	Iron Age copper alloy coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74082	FS	Early Medieval copper alloy brooch	Findspot	450 AD to 575 AD	Early Medieval or Anglo-Saxon
MKE74084	FS	Iron Age copper alloy coin	Findspot	40 BC to 25 BC	Late Iron Age
MKE74094	FS	Iron Age silver coin	Findspot	15 AD to 30 AD	Late Iron Age
MKE74101	FS	Iron Age coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age
MKE74102	FS	Iron Age coin	Findspot	150 BC to 100 BC	Middle Iron Age to Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74117	FS	Iron Age coin	Findspot	100 BC to 150 BC	Late Iron Age to Middle Iron Age
MKE74131	FS	Iron Age coin	Findspot	15 AD to 30 AD	Late Iron Age
MKE74132	FS	Iron Age silver coin	Findspot	35 AD to 39 AD	Late Iron Age
MKE74146	FS	Iron Age coin	Findspot	1 AD to 15 AD	Late Iron Age
MKE74155	FS	Iron Age coin	Findspot	25 BC to 5 BC	Late Iron Age
MKE74156	FS	Iron Age coin	Findspot	5 BC to 1 BC	Late Iron Age
MKE74164	FS	Roman silver finger ring	Findspot	200 AD to 300 AD	Roman
MKE74166	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74178	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74182	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74216	FS	Early Medieval gold pendant	Findspot	550 AD to 700 AD	Early Medieval or Anglo-Saxon
MKE74235	FS	Roman copper alloy hair pin	Findspot	43 AD to 402 AD	Roman
MKE74243	FS	Roman copper alloy coin	Findspot	332 AD to 333 AD	Roman
MKE74244	FS	Roman copper alloy coin	Findspot	351 AD to 353 AD	Roman
MKE74245	FS	Roman copper alloy coin	Findspot	41 AD to 250 AD	Late Iron Age to Roman
MKE74246	FS	Medieval copper alloy buckle	Findspot	1200 AD to 1550 AD	Medieval to Post Medieval
MKE74247	FS	Post Medieval copper alloy buckle	Findspot	1620 AD to 1680 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74248	FS	Medieval copper alloy buckle	Findspot	1350 AD to 1400 AD	Medieval
MKE74249	FS	Early Medieval copper alloy small long brooch	Findspot	400 AD to 599 AD	Roman to Early Medieval or Anglo-Saxon
MKE74250	FS	Early Medieval copper alloy small long brooch	Findspot	400 AD to 599 AD	Roman to Early Medieval or Anglo-Saxon
MKE74251	FS	Post Medieval copper alloy knife	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval
MKE74252	FS	Bronze Age ingots	Findspot	2350 BC to 701 BC	Bronze Age
MKE74253	FS	Bronze Age ingots	Findspot	2350 BC to 701 BC	Bronze Age
MKE74254	FS	Early Medieval brooch	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
MKE74255	FS	Early Medieval grave contents	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
MKE74256	FS	Iron Age grave contents	Findspot	800 BC to 42 AD	Iron Age
MKE74258	FS	copper alloy purse bar	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval
MKE74259	FS	Unknown copper alloy bead	Findspot	700 BC to 1600 AD	Early Iron Age to Post Medieval
MKE74260	FS	Unknown copper alloy bead	Findspot	700 BC to 1600 AD	Early Iron Age to Post Medieval
MKE74261	FS	Roman copper alloy spoon	Findspot	100 AD to 300 AD	Roman
MKE74262	FS	Bronze Age copper alloy hoard	Findspot	1200 BC to 700 BC	Middle Bronze Age to Early Iron Age
MKE74271	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74277	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74300	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74364	FS	Iron Age gold coin	Findspot	800 BC to 42 AD	Iron Age
MKE74388	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74389	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74409	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74413	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74414	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74415	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74424	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74425	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74430	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74432	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74434	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74435	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74450	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74456	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74462	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE74463	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74466	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74479	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74492	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74500	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74501	FS	Iron Age silver coin	Findspot	800 BC to 42 AD	Iron Age
MKE74512	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74513	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74514	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74515	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74519	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74543	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74544	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74545	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74549	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE74550	FS	Iron Age copper alloy coin	Findspot	800 BC to 42 AD	Iron Age
MKE80125	FS	Iron Age copper alloy harness fitting	Findspot	300 BC to 200 AD	Middle Iron Age to Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE80139	FS	copper alloy knife	Findspot	1020 BC to 800 BC	Middle Bronze Age to Late Bronze Age
MKE80144	FS	copper alloy chape	Findspot	1300 AD to 1500 AD	Medieval
MKE80149	FS	copper alloy mount	Findspot	1600 AD to 1800 AD	Post Medieval
MKE80159	FS	copper alloy spoon	Findspot	1600 AD to 1800 AD	Post Medieval
MKE80175	FS	Roman copper alloy unidentified object	Findspot	43 AD to 1800 AD	Roman to Post Medieval
MKE80176	FS	Early Medieval copper alloy brooch	Findspot	500 AD to 600 AD	Early Medieval or Anglo-Saxon
MKE80178	FS	copper alloy brooch	Findspot	43 AD to 100 AD	Roman
MKE80179	FS	copper alloy buckle	Findspot	1350 AD to 1450 AD	Medieval
MKE80180	FS	copper alloy coin	Findspot	71 AD	Roman to Unknown
MKE80184	FS	white metal blade	Findspot		
MKE86831	FRM	Plumstone Farm	Farmstead	1800 AD	Post Medieval
MKE86901	FRM	Outfarm north west of Cleve Court Farm	Farmstead	1800 AD	Post Medieval
MKE86902	FRM	Cleve Court Farm	Farmstead	1540 AD	Post Medieval
MKE86904	FRM	Street Farm	Farmstead	1800 AD	Post Medieval
MKE86916	FRM	Alland Grange Farm	Farmstead	1800 AD	Post Medieval
MKE86917	FRM	Wayborough Farm	Farmstead	1800 AD	Post Medieval
MKE86918	FRM	Outfarm west of Wayborough Farm	Farmstead	1800 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE86961	FRM	Wayborough Farm	Farmstead	1800 AD	Post Medieval
MKE86962	FRM	Cheesman's Farm	Farmstead	1600 AD	Post Medieval
MKE86971	FRM	Pouces	Farmstead	1800 AD	Post Medieval
MKE86972	FRM	Thorne Farm	Farmstead	1540 AD	Post Medieval
MKE87015	FRM	Vincent Farm	Farmstead	1800 AD	Post Medieval
MKE87016	FRM	Fleet Farm	Farmstead	1800 AD	Post Medieval
MKE87017	FRM	Fleete Court	Farmstead	1800 AD	Post Medieval
MKE87018	FRM	Manston Court	Farmstead	1800 AD	Post Medieval
MKE87019	FRM	Wood Farm	Farmstead	1800 AD	Post Medieval
MKE87020	FRM	Foster's Folly	Farmstead	1800 AD	Post Medieval
MKE87021	FRM	Manston Green Farm (Manstongreen Farm)	Farmstead	1800 AD	Post Medieval
MKE87022	FRM	Grove Farm (Manston Grove)	Farmstead	1800 AD	Post Medieval
MKE87023	FRM	Bush Farm	Farmstead	1800 AD	Post Medieval
MKE87024	FRM	Great Cliffsend Farm	Farmstead	1800 AD	Post Medieval
MKE87025	FRM	Farmstead at Cliffesend	Farmstead	1800 AD	Post Medieval
MKE87047	FRM	Litte Cliffsend Farm	Farmstead	1800 AD	Post Medieval
MKE87048	FRM	Ozengell Grange (Ozengell Farm)	Farmstead	1700 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE87049	FRM	Sprattling Court Farm	Farmstead	1800 AD	Post Medieval
MKE87050	FRM	Preston Farm	Farmstead		
MKE88749	FRM	Rose Farm	Farmstead	1800 AD	Post Medieval
MKE88751	FRM	Cliffsend Farm (Bethlehem Farm)	Farmstead	1800 AD	Post Medieval
MKE91336	MON	Thorne Farm: possible Roman inhumation and possible undated ditch	Inhumation, ditch	100 AD	Roman to Unknown
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern
MKE91767	MON	Two windmills beneath Manston Airfield	Windmill, building	1839 AD to 1907 AD	Post Medieval to Modern
MKE91805	MON	Cropmark of a probable chalk pit visible on 1990 aerial photograph	Chalk pit		
MKE92407	MON	Reputed semi-underground hanger dating to First World War, shown on OS map	Hangar?	1914 AD to 1918 AD	Modern
MKE92417	MON	Possible neolithic pit, neolithic pottery and mesolithic and neolithic flints at Cliffs End Farm			
MKE93154	MON	Auxiliary unit operational base			
MKE97011	FS	Medieval Copper alloy brooch	Findspot		
MKE97017	FS	Post Medieval Copper alloy seal matrix	Findspot	1700 AD to 1800 AD	Post Medieval
MKE97061	FS	Copper alloy furniture fitting	Findspot	1650 AD to 1750 AD	Post Medieval
MKE97063	FS	Copper alloy dress hook	Findspot	1500 AD to 1600 AD	Medieval to Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE97064	FS	Copper alloy mount	Findspot	1600 AD to 1700 AD	Post Medieval
MKE97536	MON	Undated Pit, Bay View, Windsor Road, Ramsgate	Pit		
MKE97568	MON	Dump of surplus equipment from an American Airbase, South East of 'The Dump', Manston Road, Margate.	Refuse disposal site	1939 AD to 1950 AD	Modern
MKE97770	LB	Manston War Memorial	War memorial (freestanding)	1921 AD to 2050 AD	Modern
MKE97850	MON	Late Iron Age/ Early Roman Material (Manston)	Pit, linear earthwork	100 BC to 150 AD	Late Iron Age to Roman
MKE97851	MON	Post-Medieval Material and Features			
MKE98004	MON	Site of RNAS Manston			
MKE98024	MON	World War Two aircraft dispersal bay at the former Manston Airport.	Dispersal pen		
MKE98027	MON	World War Two RAF Battle HQ at the former Manston Airport.	Airfield defence site	1901 AD to 2050 AD	Modern
MKE98029	MON	RAF Manston intelligence hut.	Airfield building	1940 AD to 1943 AD	Modern
MKE98029	MON	RAF Manston intelligence hut.	Airfield building	1940 AD to 1943 AD	Modern
MKE98340	MON	Royal Observer Corps Listening Post	Underground monitoring post		
MKE98504	MON	Multi-compartment ?HE stores			
MKE98697	MON	Lidar and Air photo record of Ozengell Grange area; Neolthic and Bronze Age	Ring ditch, ring ditch, mound?	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
MKE98698	MON	Air Photo and Lidar mapping, Ozengel Grange, Ramsgate; Iron age and Roman	Enclosure, ditch, rectilinear enclosure, boundary	800 BC to 409 AD	Early Iron Age to Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
MKE98701	MON	Air Photo and Lidar Mapping, Ozengell Grange, Ramsgate; Early Medieval/Anglo-Saxon	Grave	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
MKE98702	MON	Air photo and lidar mapping for land at Ozengell Grange, Ramsgate; Medieval	Rectilinear enclosure, pit, enclosure, feature	1100 AD to 1300 AD	Medieval
MWX43748	MON	Brick works, Pegwell	Brickworks	1908 AD to 1938 AD	Modern
TR 36 NE 108	MON	Double ditched ring ditch, near Ozengell Grange, Ramsgate	Pit, ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 NE 109	MON	Rectilinear enclosure, near Ozengell Grange, St. Lawrence, Ramsgate	Rectilinear enclosure, pit		
TR 36 NE 119	MON	Romano-British ditches and midden materials, Manston	Midden	43 AD to 409 AD	Roman
TR 36 NE 121	MON	Medieval settlement/industrial Site?, Manston, Thanet	Settlement?, industrial site?, enclosure, grubenhaus?, manor house?	1100 AD to 1399 AD	Medieval
TR 36 NE 127	MON	Possible Romano-British domestic site, Nethercourt, Ramsgate	Settlement?, cremation, ditched enclosure, post hole	43 AD to 409 AD	Roman
TR 36 NE 174	MON	Possible Roman pond, Manston	Chalk pit?, enclosure, pond?	43 AD to 409 AD	Roman
TR 36 NE 175	MON	Roman building and enclosure, near Lydden, Manston	Building, ditched enclosure	43 AD to 409 AD	Roman
TR 36 NE 177	MON	Roman Villa Farm at the site of Ozengell Grange, Ramsgate	Villa, inhumation, building	43 AD to 409 AD	Roman
TR 36 NE 181	MON	Barrow, North of Canterbury Road West, Manston	Barrow	2350 BC to 701 BC	Bronze Age
TR 36 NE 182	MON	Late Neolithic / early Bronze Age barrow, North of Canterbury Road West	Oval barrow	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 NE 2001	MON	Romano-British and Jutish features and associated finds, Nethercourt Estate, Ramsgate	Ditch, grave?	43 AD to 1065 AD	Roman to Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 2010	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2108	LB	Ozengell Grange	Site, house, house, outbuilding, date stone	1711 AD to 1999 AD	Post Medieval to Modern
TR 36 NE 2166	MON	Second World War roadblock.	Defence work	1939 AD to 1945 AD	Modern
TR 36 NE 2168	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2170	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2171	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 2178	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NE 223	MON	Romano-British quarry at Spratling Court Farm, Manston	Quarry	43 AD to 409 AD	Roman
TR 36 NE 2247	LB	Barn about 50 metres east of Ozengell Grange	Site, timber framed barn, timber framed barn, timber framed barn, timber framed barn, tithe barn, tithe barn, tithe barn, tithe barn, aisled barn, aisled barn, aisled barn, aisled barn	1367 AD to 1799 AD	Medieval to Post Medieval
TR 36 NE 227	MON	Farmhouse, barn and possible monastic grange, Ozengell Grange, Ramsgate	Barn, house, grange?	1066 AD to 1900 AD	Medieval to Post Medieval
TR 36 NE 2379	LB	Barn at Preston Farm (TR 3507 6686)	Site, timber framed barn, aisled barn	1680 AD to 1720 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 2403	FS	Single small Palaeolithic handaxe discovered during the Margate and Broadstairs Urban Wastewater Treatment Scheme (2005 to 2006)	Findspot	C	Lower Palaeolithic to Middle Palaeolithic
TR 36 NE 2407	MON	Pair of ring-ditches that may be contiguous	Ring ditch		
TR 36 NE 2409	MON	Bronze Age to iron age features found during 2004 excavations	Hollow way, ditch, gully, pit, ditch, gully	1000 BC to 101 BC	Late Bronze Age to Middle Iron Age
TR 36 NE 2421	MON	Auxiliary Unit Observation Post	Auxiliary unit observation post	1940 AD to 1945 AD	Modern
TR 36 NE 245	MON	Undated ring ditch, St. Lawrence, Ramsgate	Ring ditch		
TR 36 NE 26	MON	Early medieval cemetery and associated finds, Ozengall, Ramsgate and Manston	Inhumation, cemetery, coffin	43 AD to 699 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NE 274	MON	Ring ditch cropmarks, Ozengell Grange, Ramsgate	Ring ditch		
TR 36 NE 275	MON	Ring ditch cropmarks, St. Lawrence, Ramsgate	Ring ditch		
TR 36 NE 276	MON	Ring ditch cropmarks, possible barrows, Ozengell Grange, Ramsgate	Ring ditch		
TR 36 NE 28	MON	Site of Upper Court Manor House, St. Lawrence, Ramsgate	Manor house, boundary ditch	1300 AD to 1475 AD	Medieval
TR 36 NE 283	MON	Ring ditch, north of Cliffs End	Ring ditch		
TR 36 NE 341	FS	Site of Romano-British building - Staner hill, Ramsgate	Findspot	43 AD to 409 AD	Roman
TR 36 NE 343	FS	Romano-British scatter, Stanton Hill, Manston	Findspot	43 AD to 409 AD	Roman
TR 36 NE 344	MON	Prehistoric pottery, Anglo-Saxon feature and finds, Ozengell Grange, Ramsgate	Post hole?	410 AD to 1065 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 376	MON	Chalk pit at Coldswood Farm, Manston	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NE 377	MON	Chalk pit at Spratling court, Manston	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NE 397	MON	Prehistoric flint scatter, prehistoric pot and an undated pit, Manston Road, Ramsgate	Flint scatter, pit	2350 BC to 701 BC	Bronze Age
TR 36 NE 40	MON	Two Iron Age pits found on Thirlmere Avenue, Nethercourt, Ramsgate	Pit	800 BC to 42 AD	Iron Age
TR 36 NE 402	MON	Newington windmill	Windmill	1540 AD to 1900 AD	Post Medieval
TR 36 NE 406	MON	Late Bronze Age/early Iron Age postholes & pits, north of Canterbury Road West, Manston	Post hole, pit	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NE 427	MON	Bronze Age/Early Medieval/Medieval site, Manston Rd	Ditch, ditch, pit, post hole, wall	2350 BC to 1539 AD	Early Bronze Age to Medieval
TR 36 NE 455	MON	Saxo-Norman buildings and enclosures, Manston Road, Ramsgate	Grubenhaus, enclosure, ditch, timber framed building, enclosure, timber framed building, pit, oven	1050 AD to 1225 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NE 471	MON	Late Bronze Age settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Enclosed settlement, ditch, gully, post built structure, quarry, pit, post hole, post built structure	1000 BC to 701 BC	Late Bronze Age
TR 36 NE 477	MON	Early Neolithic shallow cut found on site of new Tesco store south of Manston Road, Ramsgate	Pit	4000 BC to 2351 BC	Neolithic
TR 36 NE 484	MON	Middle Bronze Age settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 NE 485	MON	Anglo-Saxon settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Grubenhaus, ring ditch, ditch	500 AD to 699 AD	Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 486	MON	Post-Medieval settlement/activity located on site of Tesco, Manston Road, Ramsgate, Kent	Trackway	1540 AD to 1900 AD	Post Medieval
TR 36 NE 51	MON	Late Neolithic enclosures renovated and used as barrows in the Bronze Age, Ozengell Grange, Manston	Round barrow, henge, crouched inhumation, cremation	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NE 511	FS	Bronze Age flints, Bradgate Caravan Park	Findspot	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NE 54	MON	Bronze Age round barrow, Manston	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NE 548	MON	Possible machine gun post in Stannar Court	Fortification	1939 AD to 1945 AD	Modern
TR 36 NE 56	MON	Barrow/ring ditch cropmark features, Nethercourt, Ramsgate	Round barrow, ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 NE 566	MON	Former site of a Second World War pillbox, Manston Road	Pillbox, pillbox	1939 AD to 2007 AD	Modern
TR 36 NE 577	FS	Mesolithic worked flints, Manston Road, Ramsgate	Findspot	10000 BC to 4001 BC	Mesolithic
TR 36 NE 578	FS	Neolithic worked flints, Manston Road, Ramsgate	Findspot	4000 BC to 2351 BC	Neolithic
TR 36 NE 579	MON	Late Bronze Age enclosure and pits, Manston Road, Ramsgate	Enclosure?, ditch, pit	1000 BC to 701 BC	Late Bronze Age
TR 36 NE 580	MON	Late Bronze Age/Early Iron Age field system, Manston Road, Ramsgate	Field system, ditch, trackway, pit	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NE 581	MON	Iron Age field system, Manston Road, Ramsgate	Field system, ditch, trackway	800 BC to 401 BC	Early Iron Age
TR 36 NE 582	MON	Roman cremations, Manston Road, Ramsgate	Cremation, quarry, ditch, grave marker?, post hole, ditch	43 AD to 409 AD	Roman
TR 36 NE 583	MON	Anglo-Saxon occupation, Manston Road, Ramsgate	Grubenhaus, post hole, stake hole	475 AD to 700 AD	Early Medieval or Anglo-Saxon
TR 36 NE 584	MON	Medieval enclosures, Manston Road, Ramsgate	Enclosure?, ditch	1075 AD to 1225 AD	Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 588	FS	Anglo-Saxon gold shilling ('thrymsa'), Isle of Thanet	Findspot	600 AD to 675 AD	Early Medieval or Anglo-Saxon
TR 36 NE 589	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 590	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 591	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 592	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	737 AD to 758 AD	Early Medieval or Anglo-Saxon
TR 36 NE 593	FS	Anglo-Saxon silver early penny ('sceat'), Isle of Thanet	Findspot	789 AD to 796 AD	Early Medieval or Anglo-Saxon
TR 36 NE 594	FS	Anglo-Saxon copper alloy 'styca', Isle of Thanet	Findspot	810 AD to 840 AD	Early Medieval or Anglo-Saxon
TR 36 NE 595	FS	Anglo-Saxon silver penny, Isle of Thanet	Findspot	765 AD to 792 AD	Early Medieval or Anglo-Saxon
TR 36 NE 598	MON	Neolithic settlement, Preston Park Caravan Site	Curvilinear enclosure, ditch, gully, pit	4000 BC to 3001 BC	Early Neolithic
TR 36 NE 599	MON	Early Bronze Age gully, Preston Park Caravan Site	Gully	1700 BC to 1501 BC	Early Bronze Age to Middle Bronze Age
TR 36 NE 600	MON	Medieval ditches, Preston Park Caravan Site	Ditch	1100 AD to 1175 AD	Medieval
TR 36 NE 601	MON	Middle Bronze Age cremation cemetery, Manston Road, Ramsgate	Cremation cemetery, cremation, ritual pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 NE 634	FS	Mesolithic or Neolithic worked flints, Spratling Court Farm, Manston	Findspot	10000 BC to 2351 BC	Early Mesolithic to Late Neolithic
TR 36 NE 635	MON	Middle Iron Age chalk quarry, Spratling Court Farm, Manston	Quarry	400 BC to 101 BC	Middle Iron Age
TR 36 NE 636	FS	Worked flints and pottery in hillwash deposits, Spratling Court Farm, Manston	Findspot	7000 BC to 701 BC	Late Mesolithic to Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NE 637	MON	A Roman cave, Spratling Court Farm	Dene hole?	43 AD to 409 AD	Roman
TR 36 NE 673	MON	Undated features, Manston Green, Ramsgate, Kent	Pit, post hole?		
TR 36 NE 674	FS	2 Conjoining Early Post-Medieval Peg Tiles, Manston Green, Ramsgate	Findspot	1540 AD to 1650 AD	Post Medieval
TR 36 NE 679	MON	Second World war roadblock at A256 Haine Road, Hollins Bottom.	Roadblock		
TR 36 NE 85	MON	Cropmark of enclosure and curvilinear feature, Lydden, Manston	Enclosure, curvilinear enclosure, ditch	1066 AD to 1539 AD	Medieval
TR 36 NE 87	MON	Possible barrow cropmark, Manston	Barrow?	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NE 88	MON	Ditched enclosure cropmark, Manston	Macula, ditched enclosure?	43 AD to 409 AD	Roman
TR 36 NW 1012	LB	Old Forge House	Site, house, date stone	1743 AD	Post Medieval
TR 36 NW 1013	LB	Way House and Wayborough House, and Garden Wall attached	Site, timber framed house, house, garden wall, outbuilding	1550 AD to 1799 AD	Post Medieval
TR 36 NW 1015	LB	Barn at Manston Green	Site, timber framed barn, aisled barn, barn	1550 AD to 1780 AD	Post Medieval
TR 36 NW 1017	MON	Former site of a barn about 50 metres south west of Grove Farmhouse	Site, timber framed barn, aisled barn	1702 AD	Post Medieval
TR 36 NW 1018	LB	Grove Farmhouse and Walled Front Garden	Site, house, steps, garden wall	1800 AD to 1832 AD	Post Medieval
TR 36 NW 1031	LB	Granary about 25 metres south of Manston Court Farmhouse	Site, granary, timber framed building, staddle stone	1700 AD to 1799 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1041	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1043	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1044	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1046	LB	Prospect Inn	Site, public house, public house, conservatory	1939 AD to 1969 AD	Modern
TR 36 NW 1047	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1048	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1049	LB	Tudor Cottage, Way Hill	Site, jettied house, house	1500 AD to 1986 AD	Medieval to Modern
TR 36 NW 1050	MON	Anti invasion defence site	Defence	1939 AD to 1945 AD	Modern
TR 36 NW 1052	LB	Cleve Court and Cleve Lodge	House, site, house, service wing, timber framed building, steps, house	1540 AD to 1900 AD	Post Medieval
TR 36 NW 1055	LB	Flete Lodge	Site, house	1820 AD to 1860 AD	Post Medieval
TR 36 NW 1059	MON	Pillbox	Pillbox, pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1059	MON	Pillbox	Pillbox, pillbox	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1060	LB	Cheeseman's Farm	Site, farmhouse, farmhouse	1600 AD to 1866 AD	Post Medieval
TR 36 NW 1062	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1064	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1065	MON	Anti invasion defence site	Defence	1939 AD to 1945 AD	Modern
TR 36 NW 1068	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1071	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1072	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1075	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1076	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1077	MON	Pillbox	Pillbox	1939 AD to 1945 AD	Modern
TR 36 NW 1086	CRA	Crash site of Supermarine Spitfire I	Aircraft crash site, spitfire	1940 AD	Modern
TR 36 NW 1087	CRA	Crash site of Supermarine Spitfire I	Aircraft crash site, spitfire	1940 AD	Modern
TR 36 NW 1088	CRA	Crash site of Messerschmitt Bf110D	Aircraft crash site, me110	1940 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1089	CRA	Crash site of Messerschmitt Bf110D	Aircraft crash site, me110	1940 AD	Modern
TR 36 NW 1090	CRA	Crash site of Heinkel He 111H-2	Aircraft crash site, he111	1940 AD	Modern
TR 36 NW 1091	CRA	Crash site of Messerschmitt Bf109E-4	Aircraft crash site, me109	1940 AD	Modern
TR 36 NW 1095	MON	Cropmark of a ring ditch, to the north of Minster, Thanet	Ring ditch		
TR 36 NW 1096	MON	Cropmarks of four ring ditches, to the north of Minster, Thanet	Ring ditch		
TR 36 NW 1097	MON	Thorne Farm: Two shallow ditches, undated	Ditch		
TR 36 NW 1099	MON	Thorne Farm: Two shallow ditches, early Iron Age and undated	Ditch, ditch	750 BC to 400 BC	Late Bronze Age to Middle Iron Age
TR 36 NW 1100	MON	Linear cropmark features Way Farm cottages	Linear feature		
TR 36 NW 1102	MON	Linear cropmarks at Lord of the Manor, Thanet	Linear feature		
TR 36 NW 1106	MON	Possible ring-ditch on 1982 aerial photograph but not visible on south-west side. On 1967 aerial photo it appears to be a chalk pit	Ring ditch?, chalk pit?		
TR 36 NW 1108	MON	Romano-British burials and cremations discovered during excavation and pipeline work	Inhumation cemetery, cremation cemetery	43 AD to 409 AD	Roman
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1108	MON	Former location of four boundary stones that do not follow the parish boundary	Boundary stone		
TR 36 NW 1111	MON	"The Manor House", Lord of the Manor, Manston	Toll house	1830 AD	Post Medieval to Unknown
TR 36 NW 1122	MON	Cropmark of a possible chalk pit at Thorne Farm	Chalk pit?		
TR 36 NW 1123	MON	Linear parallel cropmarks east of Thorne Farm	Linear feature	1540 AD to 1860 AD	Post Medieval
TR 36 NW 1125	MON	Dew-pond or small chalk pit, Pouces Cottages	Chalk pit?	1540 AD to 1860 AD	Post Medieval
TR 36 NW 1127	MON	Cropmark of a probable chalk pit, middle of a line of three between Way Hill and Thorne Hill	Chalk pit		
TR 36 NW 1128	MON	Cropmark of a probable chalk pit, westernmost of a line of three between Way Hill and Thorne Hill	Chalk pit		
TR 36 NW 1128	MON	Cropmark of a probable chalk pit, easternmost of a line of three between Way Hill and Thorne Hill	Chalk pit		
TR 36 NW 1130	MON	Cropmark of a probable chalk pit, east of Wayborough House	Chalk pit?		
TR 36 NW 1131	MON	Cropmark of a probable small chalk pit, north-east of Thorne Farm adjacent to a concrete farm track	Chalk pit?		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1133	MON	Cropmarks of possible very small pits adjacent A253 north of Cliffsend	Pit		
TR 36 NW 1135	MON	Crop-soil markings showing two ring-ditches, Way	Ring ditch		
TR 36 NW 1136	MON	Roman circular enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, stock enclosure?	43 AD to 409 AD	Roman
TR 36 NW 1137	MON	Roman fields and enclosures, possibly part of a 'ladder' settlement discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure	43 AD to 409 AD	Roman
TR 36 NW 1138	MON	Roman trackway discovered during the East Kent Access Route excavations (2009-2011)	Trackway	43 AD to 409 AD	Roman
TR 36 NW 1139	MON	Early bronze age pit discovered during the East Kent Access Route excavations (2009-2011)	Pit	2350 BC to 1501 BC	Early Bronze Age
TR 36 NW 1140	MON	Second World War zig-zag trench discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1141	MON	Medieval linear feature discovered during the East Kent Access Route excavations (2009-2011)	Linear feature	1050 AD to 1350 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NW 1142	MON	Three Anglo-Saxon graves discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	500 AD to 699 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1143	MON	Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation	500 AD to 699 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1144	MON	Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 699 AD	Roman to Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1145	MON	Two Anglo-Saxon hollow ways discovered during the East Kent Access Route excavations (2009-2011)	Hollow way	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1146	MON	Romano-British cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation	43 AD to 409 AD	Roman
TR 36 NW 1147	MON	1st to 3rd century AD cemetery and enclosure discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, cremation, inhumation, enclosure, oven?	43 AD to 409 AD	Roman
TR 36 NW 1148	MON	Possible iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, field system?	800 BC to 42 AD	Iron Age
TR 36 NW 1149	MON	Late Anglo-Saxon pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	850 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1151	MON	Second World War defensive trenches discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1152	MON	Late bronze age enclosure, ditches and pit discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, pit, ditch	1000 BC to 701 BC	Late Bronze Age
TR 36 NW 1153	MON	Early to middle iron age post-built structures, ditch, pit and inhumation discovered during the East Kent Access Route excavations (2009-2011)	Post built structure, pit, post hole, ditch, inhumation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1154	MON	Two large trackways of late iron age / Roman date discovered during the East Kent Access Route excavations (2009-2011)	Trackway	100 BC to 409 AD	Late Iron Age to Roman
TR 36 NW 1154	MON	Two large trackways of late iron age / Roman date discovered during the East Kent Access Route excavations (2009-2011)	Trackway	100 BC to 409 AD	Late Iron Age to Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1155	MON	Five sunken-feature buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus, inhumation, post hole, pit, hearth	43 AD to 409 AD	Roman
TR 36 NW 1156	MON	Small Roman cemetery discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 409 AD	Roman
TR 36 NW 1157	MON	One inhumation and two cremations discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, cremation	43 AD to 409 AD	Roman
TR 36 NW 1158	MON	Roman linear features discovered during the East Kent Access Route excavations (2009-2011)	Ditch	43 AD to 409 AD	Roman
TR 36 NW 1159	MON	Anglo-Saxon trackway discovered during the East Kent Access Route excavations (2009-2011)	Trackway	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1160	MON	Small Anglo-Saxon cemetery discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1161	MON	Second World War zig-zag defensive trench discovered during the East Kent Access Route excavations (2009-2011)	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1162	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1163	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1164	MON	Small bronze age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch, inhumation	2350 BC to 701 BC	Bronze Age
TR 36 NW 1165	MON	Seven probable bronze age inhumation burials and one cremation discovered during the	Inhumation, cremation	2350 BC to 701 BC	Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
		East Kent Access Route excavations (2009-2011)			
TR 36 NW 1166	MON	Medieval field or enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure?	1066 AD to 1539 AD	Medieval
TR 36 NW 1167	MON	Iron Age horseshoe enclosure, ditches and boundaries discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, pit, ditch	500000 BC to 42 AD	Prehistoric
TR 36 NW 1168	MON	Possible Roman or medieval features discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, ditch, pit	43 AD to 1539 AD	Roman to Medieval
TR 36 NW 1169	MON	Bronze Age barrow (possibly with neolithic origins) discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, pit	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 NW 1170	MON	Bronze Age barrow (possibly with neolithic origins) discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, grave, inhumation, ditch	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 NW 1171	MON	Bronze Age barrow discovered during the East Kent Access Route excavations (2009-2011)	Barrow?, ring ditch, inhumation, ditch, pit?	2350 BC to 42 AD	Early Bronze Age to Late Iron Age
TR 36 NW 1172	MON	Iron Age or Roman pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1173	MON	Bronze Age pit, discovered during the East Kent Access Route excavations (2009-2011)	Pit	2350 BC to 701 BC	Bronze Age
TR 36 NW 1174	MON	Iron Age features, including probable post-built structure and inhumation discovered during the East Kent Access Route excavations (2009-2011)	Post hole, post built structure, inhumation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 NW 1176	MON	Late iron age / early Roman settlement and enclosures, Manston Airport car-park	Enclosure, pit, gully, grubenhaus, quarry, pottery kiln, cremation	100 BC to 125 AD	Late Iron Age to Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1177	FS	Early medieval pottery fragments recovered during excavation	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 1178	FS	Roman pottery has been recorded at this location. No further details.	Findspot	43 AD to 409 AD	Roman
TR 36 NW 1179	MON	Foundations associated with the 19th century Fever Hospital, discovered during the East Kent Access Route excavations (2009-2011)	Infectious diseases hospital, well	1836 AD	Post Medieval to Unknown
TR 36 NW 1180	MON	Semi-underground hangar dating to First World War, still partly extant	Hangar?	1914 AD to 1918 AD	Modern
TR 36 NW 1182	BLD	Possible nissen hut, maybe of Second World War origin, noted in 2008 desk-based assessment	Nissen hut?	1939 AD to 1945 AD	Modern
TR 36 NW 1183	MON	Former Second World War oil depot, Canterbury Road West, Ramsgate	Storage tank, control room, pump house	1944 AD to 1960 AD	Modern
TR 36 NW 1191	MON	Early Roman Cremation Burials and Roman Pottery (Manston Road)	Cremation burial, cremation pit	43 AD to 200 AD	Roman
TR 36 NW 1194	MON	Prehistoric Features, Pottery and Struck Flint, Manston Road	Linear feature, curvilinear enclosure, plough marks	500000 BC to 42 AD	Prehistoric
TR 36 NW 1195	MON	Undated Archaeological Features, Manston Road	Pit, post hole, ditch, linear feature		
TR 36 NW 1196	MON	Hill House Military Hospital, Minster, Ramsgate	Hospital	1914 AD to 1918 AD	Modern
TR 36 NW 1200	MON	Second World War Auxiliary Unit base. Top of Windsor Road, Cliffsend.	Auxiliary unit operational base	1940 AD to 1945 AD	Modern
TR 36 NW 1201	MON	Alland Grange Farmhouse: Set of tunnels used by a Special Duties Organisation (Auxiliary units).	Auxiliary unit operational base	1940 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1202	MON	Pillbox	Pillbox	1940 AD to 1945 AD	Modern
TR 36 NW 1203	MON	Semi-underground hangar dating to First World War, never finished.	Aircraft hangar	1914 AD to 1918 AD	Modern
TR 36 NW 1220	MON	Trench system visible as crop marks	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1221	MON	Zig-zag trench system visible as earthworks	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 1222	MON	Zig-zag trench system	Trench	1939 AD to 1945 AD	Modern
TR 36 NW 123	MON	Barrow cropmark feature, near Retreat Farm, Margate	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 1237	MON	?1946 aerial shows very clearly large semi-circle cluster of accommodation units fronting on Manston Road.			
TR 36 NW 1238	MON	Approx site of ?radar array			
TR 36 NW 1242	MON	Approximate position of 'Klein-kampfanlage' shown on 11.1940 Luftwaffe map			
TR 36 NW 1243	MON	Position of 'Radio Station' shown on 11.1940 Luftwaffe map.			
TR 36 NW 1244	MON	Approximate position of 'Klein-kampfanlage' .			
TR 36 NW 1245	MON	?Ammunition WWII store.			

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1246	MON	?Ammunition WWII store			
TR 36 NW 1247	MON	?Ammunition WWII store			
TR 36 NW 1249	MON	?Ammunition WWII store			
TR 36 NW 1250	MON	?Ammunition WWII store			
TR 36 NW 1251	MON	?Ammunition WWII store			
TR 36 NW 1252	MON	?Ammunition WWII store			
TR 36 NW 1253	MON	?Ammunition WWII store			
TR 36 NW 1254	MON	Bank to ?			
TR 36 NW 1255	MON	?Ammunition WWII store			
TR 36 NW 1256	MON	?Ammunition WWII store			
TR 36 NW 1257	MON	?Ammunition WWII store			
TR 36 NW 1258	MON	Bank to ?contain blast.			
TR 36 NW 1259	MON	Bank to ?contain blast.			

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 1260	MON	2013 extant ?CHLradio tower .			
TR 36 NW 1261	MON	Possible Klein-kampfanlage shown on 11.1940 Luftwaffe map.			
TR 36 NW 1262	MON	Possible Klein-kampfanlage shown on 11.1940 Luftwaffe map			
TR 36 NW 1263	MON	Klein-kampfanlage shown on 11.1940 Luftwaffe map.			
TR 36 NW 1264	MON	'Munitions dump' shown on 11.1940 Luftwaffe map.			
TR 36 NW 1265	MON	hidden auxiliary base			
TR 36 NW 132	MON	Undated enclosure, Margate	Site		
TR 36 NW 133	MON	Enclosure	Enclosure		
TR 36 NW 134	MON	Possible post-medieval field boundary	Field boundary	1540 AD to 1900 AD	Post Medieval
TR 36 NW 135	MON	Possible post-medieval field boundary	Field boundary	1540 AD to 1900 AD	Post Medieval
TR 36 NW 136	MON	Undated enclosures, margate	Enclosure		
TR 36 NW 137	MON	Possible barrow site, near Vincent Farm, Margate	Barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 138	MON	Enclosure	Enclosure		
TR 36 NW 139	MON	Undated ring ditch, margate	Ring ditch		
TR 36 NW 15	MON	Caves of uncertain origin, Cheeseman's Farm and Alland Grange, Acol and Minster	Cave, air raid shelter	1914 AD to 1918 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 16	MON	Cheeseman's Camp enclosure, Cheeseman's Farm, Minster and Acol parishes	Enclosure		
TR 36 NW 166	MON	Goalpost enclosures, Monkton and Acol parishes	Enclosure, pit		
TR 36 NW 168	MON	Double ditch and pit cropmarks, Monkton parish	Sub circular enclosure, pit		
TR 36 NW 169	MON	Cropmark of possible Bronze Age round barrow, Acol	Barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 170	MON	Ring ditch and pit cropmarks, near Cheeseman's Farm, Acol	Pit, ring ditch		
TR 36 NW 171	MON	Enclosure cropmark, near Rose Farm, Minster parish	Goal post enclosure		
TR 36 NW 172	MON	Ring ditch cropmarks, Minster, Thanet	Barrow, ring ditch, pit?	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 173	MON	Trackway cropmarks, Minster	Trackway		
TR 36 NW 174	MON	Ring ditch cropmark, Minster	Ring ditch		
TR 36 NW 175	MON	Ring ditch and barrow cropmarks, near Mill House Hospital, Minster	Ring ditch		
TR 36 NW 176	MON	Ring ditch cropmark (possible barrow), Cottage Hill, Minster	Ring ditch		
TR 36 NW 177	MON	Late Neolithic/Early Bronze Age ditched enclosure, Laundry Road, Minster	Settlement, ditched enclosure	3000 BC to 1001 BC	Late Neolithic to Middle Bronze Age
TR 36 NW 178	MON	Barrow enclosure cropmark, Minster, Thanet	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 NW 179	MON	Sub circular cropmark (possible barrow), Minster, Thanet	Barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 18	MON	Chalk cut chamber, Acol Farm	Chalk pit?, dene hole?		
TR 36 NW 180	MON	Ring ditch cropmark, Manston	Ring ditch		
TR 36 NW 181	MON	Iron Age ditch, Minster	Ditch	800 BC to 42 AD	Iron Age
TR 36 NW 182	MON	Roman-British industrial/settlement site, Minster	Industrial site, pit, settlement	43 AD to 399 AD	Roman
TR 36 NW 183	FS	Romano-British finds, near Manston Airport, Minster	Findspot	100 BC to 409 AD	Late Iron Age to Roman
TR 36 NW 184	MON	Romano-British surface and associated finds, near the A253, Minster	Iron working site	43 AD to 409 AD	Roman
TR 36 NW 185	MON	Iron Age occupation site, Minster	Settlement, pit, ditch	800 BC to 42 AD	Iron Age
TR 36 NW 186	MON	Early medieval burials, near the A253, Minster	Inhumation cemetery	575 AD to 650 AD	Early Medieval or Anglo-Saxon
TR 36 NW 187	MON	Romano-British cemetery, near the A253, Minster	Cemetery	43 AD to 199 AD	Roman
TR 36 NW 188	MON	Romano-British ditch, near A253, Minster	Ditch	43 AD to 409 AD	Roman
TR 36 NW 189	MON	Female inhumation burial, near A253, Minster	Inhumation	200 AD to 1065 AD	Roman to Early Medieval or Anglo-Saxon
TR 36 NW 190	MON	Iron Age settlement, near A253, Manston	Settlement, pit	800 BC to 42 AD	Iron Age
TR 36 NW 192	FS	Iron arrow barb fragments, Minster	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 193	FS	Bronze blade and fragments, near A253, Minster	Hoard	2350 BC to 701 BC	Bronze Age
TR 36 NW 195	MON	Early medieval inhumations, near A253, Minster	Cemetery	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 208	MON	Enclosure cropmark, Mount Pleasant, Minster	Enclosure		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 209	MON	Roman industrial/occupation site, Minster	Settlement, bloomery	43 AD to 409 AD	Roman
TR 36 NW 210	MON	Enclosure and round barrow cropmarks, near Manston Airport, Minster	Barrow, enclosure	4000 BC to 1065 AD	Early Neolithic to Early Medieval or Anglo-Saxon
TR 36 NW 211	MON	Enclosure soilmark, Monkton parish	Enclosure		
TR 36 NW 212	FS	Romano-British pottery, Cleve Court, Monkton	Findspot	43 AD to 409 AD	Roman
TR 36 NW 214	MON	Barrow and linear feature cropmarks, near Mount Pleasant, Minster, Thanet	Barrow, linear feature	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 215	MON	Inhumation burials, Minster Laundry Industrial Estate, Minster	Inhumation		
TR 36 NW 216	FS	Early-medieval bead and iron knife, near A253, Minster	Findspot	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 218	MON	Undated inhumation burials, Minster	Inhumation		
TR 36 NW 22	LB	REMAINS OF MONASTIC BUILDING, NOW OUTBUILDING	Site, first floor hall house, outbuilding, augustinian grange, first floor hall house, augustinian grange	1215 AD to 1799 AD	Medieval to Post Medieval
TR 36 NW 220	FS	Belgic pottery	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 221	FS	Romano-British pottery	Findspot	43 AD to 409 AD	Roman
TR 36 NW 222	MON	Denehole, Plumstone road, Monkton parish	Dene hole	43 AD to 409 AD	Roman
TR 36 NW 224	FS	Celtic coin, Acol	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 225	FS	Iron Age pottery, near Cleve Court, Monkton parish	Findspot	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 226	MON	Bronze Age/early Iron Age settlement, near Pouces Cottages, Minster	Settlement	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NW 228	MON	Manston grange farm	Barn, barn	1540 AD to 1900 AD	Post Medieval
TR 36 NW 229	LB	MANSTON COURT AND WALL ADJACENT	Site, house, wall	1853 AD to 2050 AD	Post Medieval to Modern
TR 36 NW 233	MON	Ring ditch cropmark, Plumstone Farm, Monkton	Ring ditch		
TR 36 NW 234	MON	Ring ditch cropmark, near Vincent Farm, Ramsgate	Ring ditch		
TR 36 NW 237	MON	Undated maculas and pits, near Plumstone Farm, Monkton	Macula, pit		
TR 36 NW 238	MON	Romano-British settlement, Minster parish	Shrine, hollow way, enclosure, well	43 AD to 409 AD	Roman
TR 36 NW 239	MON	Romano British features, Minster parish	Granary, hollow way, enclosure, pit, post hole	175 AD to 409 AD	Roman
TR 36 NW 240	MON	Anglo-Saxon cemetery, hollow way and ditch, Minster parish	Cemetery, hollow way, ditch	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 241	MON	Macula cropmark feature, possible barrow, Dellside, Minster, Thanet	Macula, barrow?	2350 BC to 701 BC	Bronze Age
TR 36 NW 242	MON	Ring ditch cropmark, Manston Park, Acol	Ring ditch		
TR 36 NW 243	MON	Macula cropmark feature, possible Neolithic long barrow, Ramsgate	Macula, long barrow?	4000 BC to 2351 BC	Neolithic
TR 36 NW 244	MON	Ring ditch cropmark feature, Manston aerodrome, Minster	Ring ditch		
TR 36 NW 245	MON	Ring ditch cropmark, Manston Aerodrome, Minster	Ring ditch		
TR 36 NW 246	MON	Medieval Farmstead, Manston, Thanet	Farmstead, timber framed building, enclosure	1200 AD to 1375 AD	Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 249	MON	Ring ditch cropmark feature, Laundry Road, Minster	Ring ditch		
TR 36 NW 251	MON	Ring ditch and enclosure cropmarks, Kent International Business Park, Acol	Enclosure, ring ditch, henge?	3000 BC to 701 BC	Late Neolithic to Late Bronze Age
TR 36 NW 252	MON	Three ring ditches, Cleve Court, Monkton	Ring ditch		
TR 36 NW 253	MON	Ring ditch cropmark and possible trackway, Kent International Business Park	Round barrow, trackway	2350 BC to 701 BC	Bronze Age
TR 36 NW 254	MON	Medieval farmstead enclosure, Kent International Business Park, Acol	Farmstead, enclosure, grubenhaus	1150 AD to 1250 AD	Medieval
TR 36 NW 255	MON	Enclosure cropmark, Kent International Business Park, Acol	Enclosure	43 AD to 1539 AD	Roman to Medieval
TR 36 NW 256	MON	Cropmark of Bronze Age round barrow, Manston, Minster	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 257	MON	Cropmarks of ring ditches and trackway, Acol	Trackway, ring ditch		
TR 36 NW 258	MON	Possible Kiln base, Cleve Court, Monkton parish	Kiln?		
TR 36 NW 259	MON	Undated ditch and pit, Manston	Ditch, pit		
TR 36 NW 26	FS	Iron Age coins found at an unknown location on the Isle of Thanet	Findspot	800 BC to 42 AD	Iron Age
TR 36 NW 260	CRA	Douglas Havoc Mark I BB893	Aircraft crash site, douglas	1940 AD to 1941 AD	Modern
TR 36 NW 27	MON	Late 1st century/early 2nd century Romano-British cremations, Minster	Cremation	43 AD to 409 AD	Roman
TR 36 NW 28	FS	Roman coin hoard, Mount Pleasant, Minster	Findspot	43 AD to 409 AD	Roman
TR 36 NW 301	MON	Prehistoric pit/ditch, Mount Pleasant, Minster parish	Feature	800 BC to 42 AD	Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 306	MON	Goal post enclosure and linear cropmarks, Mount Pleasant, Minster	Enclosure, linear feature, pit		
TR 36 NW 308	MON	Ring ditch cropmark, Mount Pleasant	Ring ditch		
TR 36 NW 324	MON	Post medieval Icehouse, Cleve Court	Icehouse	1861 AD to 1940 AD	Post Medieval to Modern
TR 36 NW 327	MON	Freehold chalk pit, Minster	Chalk pit	1540 AD to 1896 AD	Post Medieval
TR 36 NW 328	MON	Dellside chalk pit, Minster	Chalk pit	1540 AD to 1896 AD	Post Medieval
TR 36 NW 329	MON	Way chalk pit, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 NW 331	MON	Thorne Hill chalk pit, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 NW 332	BLD	One man air raid shelter, near the Spitfire Memorial, Manston	Air raid shelter	1939 AD to 1945 AD	Modern
TR 36 NW 335	MON	Cheeseman Farm caves chalk pit, Acol	Chalk pit	1540 AD to 1861 AD	Post Medieval
TR 36 NW 336	MON	Chalkpits at Cheeseman's Farm, Minster and Acol parishes	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 NW 337	MON	Mount Pleasant chalk pit, Minster parish	Chalk pit, lime kiln	1540 AD to 1931 AD	Post Medieval to Modern
TR 36 NW 34	MON	Site of barrow, near Cliffs End, Minster parish	Round barrow, burial	2350 BC to 701 BC	Bronze Age
TR 36 NW 342	MON	Old chalk pit, near Vincent Farm, Margate	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 NW 35	MON	Early Iron Age pits, near Cliffs End, Minster parish	Pit	800 BC to 401 BC	Early Iron Age
TR 36 NW 356	MON	Round barrow, Kent International Business Park, Acol	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 357	MON	Shallow depression (possible Bronze Age pond barrow?), Acol	Hollow		
TR 36 NW 359	MON	Iron Age enclosure at Kent International Business Park, Acol	Pit, ditch, enclosure, farmstead	50 BC to 42 AD	Late Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 361	MON	Undated ring ditch, near Plumstone Farm, Monkton	Ring ditch		
TR 36 NW 368	MON	Iron Age pits at Manston	Pit	800 BC to 101 BC	Early Iron Age to Middle Iron Age
TR 36 NW 369	MON	Romano-British or later pits at Manston	Pit	43 AD to 409 AD	Roman
TR 36 NW 373	MON	Cropmark complex in Manston Airfield, Minster parish	Enclosure, linear system		
TR 36 NW 376	MON	Ring ditch and macula cropmark features, Monkton	Macula, ring ditch, pit		
TR 36 NW 377	MON	Undated cropmark features, near Plumstone Farm, Monkton	Barrow, linear feature, ring ditch, pit defined enclosure	2350 BC to 701 BC	Bronze Age
TR 36 NW 378	MON	Linear cropmark system near alland grange	Linear system		
TR 36 NW 379	MON	Ap linear feature	Linear feature		
TR 36 NW 380	MON	Ring ditch cropmark, Mill House Hospital, Minster	Ring ditch		
TR 36 NW 381	MON	Ring ditch cropmark feature, Mill House Hospital, Minster	Ring ditch		
TR 36 NW 382	MON	Iron Age pit, Laundry Road, Minster parish	Pit	800 BC to 101 BC	Early Iron Age to Middle Iron Age
TR 36 NW 383	MON	Early medieval burial(s?) and pit, Laundry Road, Minster	Pit?, inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 384	MON	Unidentified pit, near Manston Airport, Minster parish	Pit?, ditch?		
TR 36 NW 385	FS	Elizabethan coin found near Cheeseman's Farm, Minster	Findspot	1558 AD to 1603 AD	Post Medieval
TR 36 NW 386	FS	Romano-Britsh pottery sherds and tile fragments, near Manston Park, Minster parish	Findspot	43 AD to 409 AD	Roman
TR 36 NW 389	MON	Prehistoric pits, near Cleve Court, Manston	Midden, cremation?, pit?	4000 BC to 42 AD	Later Prehistoric

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 39	MON	Probable Bronze Age barrows, near Mount Pleasant, Minster parish	Ring ditch, rectangular enclosure	2350 BC to 701 BC	Bronze Age
TR 36 NW 390	FS	Bronze Age spearhead, near Cleve Court, Manston	Findspot	1000 BC to 701 BC	Late Bronze Age
TR 36 NW 391	FS	Bronze Age axehead, near Cleve Court, Manston	Findspot	1600 BC to 701 BC	Middle Bronze Age to Late Bronze Age
TR 36 NW 392	FS	Early medieval beads, near Cleve Court, Manston	Findspot	410 AD to 800 AD	Early Medieval or Anglo-Saxon
TR 36 NW 393	MON	Iron Age features, near Cleve Court, Manston	Ditch, pit	800 BC to 42 AD	Iron Age
TR 36 NW 395	MON	Late Neolithic/early Bronze Age features, Kent International Business Park, Acol	Pit?, site?	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 NW 396	MON	Middle Bronze Age ditch and pit, Kent International Business Park, Acol	Site, ditch, pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 NW 397	MON	Possible Neolithic/early Bronze Age site, Manston, Acol	Ditch, pit	4000 BC to 1501 BC	Early Neolithic to Early Bronze Age
TR 36 NW 398	MON	World War II slit trench, Kent International Business Park, Monkton and Acol parishes	Slit trench	1939 AD to 1945 AD	Modern
TR 36 NW 399	MON	Site of an RAF bombing range, Kent International Business Park, Monkton and Acol parishes	Bombing range	1918 AD to 1939 AD	Modern
TR 36 NW 401	MON	Undated ring ditch, north of Manston Airport, Minster parish	Ring ditch		
TR 36 NW 405	FS	Coin of Charles I found near Cheeseman's Farm, Minster	Findspot	1625 AD to 1649 AD	Post Medieval
TR 36 NW 432	MON	Manston military and civil aviation airfield	Airfield	1916 AD	Modern
TR 36 NW 435	MON	Field Boundary of Probable Bronze Age date, and prehistoric flints, Manston Park Bungalows	Field boundary?	2350 BC to 701 BC	Bronze Age
TR 36 NW 437	MON	Manston Caves, a mid 18th century chalk mine	Chalk pit	1740 AD to 1780 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 439	FS	Prehistoric flints, St. Catherine's Grove, Manston	Findspot	7000 BC to 701 BC	Late Mesolithic to Late Bronze Age
TR 36 NW 447	MON	Cropmarks of enclosures and a trackway, west of Manston	Rectilinear enclosure, trackway, field system, linear feature		
TR 36 NW 448	MON	Cropmark of a ring ditch, west of Manston	Ring ditch		
TR 36 NW 450	MON	Possible Roman pits, improvements to the A253 west of Minster	Pit	43 AD to 409 AD	Roman
TR 36 NW 451	MON	Undated ditches/possible ditches, improvements to the A253 west of Minster	Ditch		
TR 36 NW 452	MON	Undated pallisade trench or wall foundation, improvements to A253 west of Minster	Palisade ditch?		
TR 36 NW 453	MON	Later Prehistoric post holes, improvements on the A253 west of Minster	Post hole		
TR 36 NW 454	MON	Bronze Age burial, improvement to the A253 west of Minster	Human remains, crouched inhumation	2350 BC to 1501 BC	Early Bronze Age
TR 36 NW 455	MON	Part of Anglo-Saxon sunken featured building, improvements on A253 west of Minster	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 456	MON	Ring ditches, pits, and linear features	Ring ditch, barrow cemetery?, pit, linear feature, enclosure, grubenhaus?		
TR 36 NW 457	MON	Goalpost enclosures, Monkton and Acol parishes	Enclosure		
TR 36 NW 461	MON	Irregular enclosure, south of Westbrook	Enclosure		
TR 36 NW 466	MON	Bronze Age ditch, Manston Airport	Ditch	1200 BC to 900 BC	Middle Bronze Age to Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 467	MON	Roman pit, Manston Airport	Pit, hearth	50 AD to 150 AD	Roman
TR 36 NW 468	MON	Medieval occupation, Manston Airport	Ditch, pit, demolition debris	1100 AD to 1300 AD	Medieval
TR 36 NW 469	FS	Early Iron Age to Roman pottery, Manston Airport	Findspot	800 BC to 200 AD	Early Iron Age to Roman
TR 36 NW 470	FS	Late Bronze Age to Early Iron Age pottery, Manston Airport	Findspot	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 NW 471	FS	Mid Saxon to medieval pottery, Manston Airport	Findspot	800 AD to 1539 AD	Early Medieval or Anglo-Saxon to Medieval
TR 36 NW 474	MON	Anglo-Saxon Sunken Featured Building, Queensdown Riding and Livery Centre	Grubenhaus, pit, ditch, post hole	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 NW 475	MON	A possibly Late Iron Age pit, Queensdown Riding and Livery Centre	Pit	800 BC to 42 AD	Iron Age
TR 36 NW 476	MON	Roman ditch, Woodchurch	Ditch	75 AD to 125 AD	Roman
TR 36 NW 477	MON	Bronze Age ditch and post holes, The Hanger, The Loop, Manston	Ditch, post hole	2350 BC to 701 BC	Bronze Age
TR 36 NW 481	MON	Medieval quarry, Grove Farm, Manston	Quarry	1375 AD to 1600 AD	Medieval to Post Medieval
TR 36 NW 482	MON	Neolithic pit and pottery, Tothill Street, Minster	Pit	4000 BC to 2351 BC	Neolithic
TR 36 NW 483	MON	Bronze Age round barrow, Tothill Street, Minster	Round barrow	2350 BC to 701 BC	Bronze Age
TR 36 NW 484	MON	Iron Age settlement, Tothill Street, Minster	Pit, ditch, inhumation, post alignment, quarry	400 BC to 42 AD	Middle Iron Age to Late Iron Age
TR 36 NW 485	FS	Roman pottery, Tothill Street, Minster	Findspot	43 AD to 409 AD	Roman
TR 36 NW 486	MON	Probable Second World War structure, Tothill Street, Minster	Structure	1939 AD to 1945 AD	Modern
TR 36 NW 487	FS	Bronze age flints, Manston Court Road, Manston	Findspot	2350 BC to 701 BC	Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 488	MON	Possible Roman post holes, Manston Court Road, Manston	Post hole	43 AD to 409 AD	Roman
TR 36 NW 489	MON	Palaeolithic worked flints, The Loop, Manston	Lithic working site	C	Middle Palaeolithic
TR 36 NW 490	MON	Late Iron Age post holes, Manston	Post hole	100 BC to 42 AD	Late Iron Age
TR 36 NW 494	MON	Undated ditch, Bradgate Caravan Park	Ditch		
TR 36 NW 495	MON	An undated ditch, Woodchurch Road	Ditch		
TR 36 NW 498	FS	Anglo-Saxon silver early penny ('sceat'), Manston	Findspot	715 AD to 720 AD	Early Medieval or Anglo-Saxon
TR 36 NW 499	FS	Merovingian gold tremissis, Manston	Findspot	500 AD to 675 AD	Early Medieval or Anglo-Saxon
TR 36 NW 50	FS	Roman occupation site and associated finds, near Manston airport, Minster parish	Findspot, ditch, hollow	50 AD to 150 AD	Roman
TR 36 NW 500	MON	Middle Bronze Age-Late Bronze Age occupation, Tothill Street	Enclosure, ditch, post built structure, round house (domestic)	1600 BC to 701 BC	Middle Bronze Age to Late Bronze Age
TR 36 NW 501	MON	Late Iron Age-Roman occupation, Tothill Street	Ditch, grubenhaus, extended inhumation, post hole	100 BC to 175 AD	Late Iron Age to Roman
TR 36 NW 502	MON	Middle Bronze Age enclosures, The Loop, Manston	Pit, trackway, enclosure, post hole, waterhole, settlement?, double ditched enclosure?	2350 BC to 1001 BC	Early Bronze Age to Middle Bronze Age
TR 36 NW 503	MON	Medieval gully, The Loop, Manston	Gully	1200 AD to 1300 AD	Medieval
TR 36 NW 504	FS	Mesolithic/Early Neolithic flints, The Loop	Findspot	10000 BC to 3001 BC	Early Mesolithic to Early Neolithic
TR 36 NW 506	CRA	Crash site of Heinkel He111H-2	Aircraft crash site, he111	1940 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 507	CRA	Crash site of Hawker Typhoon IB	Aircraft crash site, typhoon	1943 AD	Modern
TR 36 NW 508	CRA	Crash site of Hawker Typhoon IB	Aircraft crash site, typhoon	1943 AD	Modern
TR 36 NW 509	CRA	Crash site of Consolidated B24J Liberator	Aircraft crash site, b24 liberator	1944 AD	Modern
TR 36 NW 510	CRA	Crash site of Consolidated B24H Liberator	Aircraft crash site, b24 liberator	1944 AD	Modern
TR 36 NW 512	CRA	Crash site of Bristol Blenheim	Aircraft crash site, blenheim	1940 AD	Modern
TR 36 NW 513	MON	An undated trackway, Manston	Trackway		
TR 36 NW 518	MON	Second World War air raid shelter, Manston Airport	Air raid shelter	1940 AD to 2050 AD	Modern
TR 36 NW 522	LB	WAYBOROUGH MANOR	House, site, jettied house, jettied house, courtyard, arch	1066 AD to 1599 AD	Medieval to Post Medieval
TR 36 NW 529	MON	Possible ring ditch, Thorne Farm, Ramsgate	Ring ditch?		
TR 36 NW 530	MON	Possible ring ditch, Thorne Farm, Ramsgate	Ring ditch?		
TR 36 NW 531	FS	Roman pottery, Thorne Farm, Ramsgate	Findspot	43 AD to 409 AD	Roman
TR 36 NW 532	FS	Medieval pottery and peg tile, Thorne Farm, Ramsgate	Findspot	1066 AD to 1539 AD	Medieval
TR 36 NW 533	MON	Cropmark of a ring ditch, to the north east of Minster	Ring ditch		
TR 36 NW 534	MON	Cropmark of a ring ditch, north of Minster	Ring ditch		
TR 36 NW 535	MON	Cropmark of a ring ditch, south of Manston near A253			
TR 36 NW 536	MON	Cropmark of a ring ditch, south of Manston near the A253	Ring ditch		
TR 36 NW 537	MON	Cropmark of a ring ditch, north of Cleve Court Farm near Acol			

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 538	MON	Cropmark of a ring ditch, North of Cleve Court Farm, near Acol	Ring ditch		
TR 36 NW 539	MON	Cropmark of a rectilinear enclosure, north of Cleve Court Farm near Acol	Rectilinear enclosure		
TR 36 NW 543	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 544	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 545	MON	Cropmark of a ring ditch, to the east of Manston runway	Ring ditch		
TR 36 NW 546	FS	East Kent Access route: Palaeolithic flake, found during excavations	Findspot	C	Palaeolithic
TR 36 NW 547	MON	Features identified by geophysical survey on the site of a proposed solar farm at Manston Airfield	Site		
TR 36 NW 547	MON	Features identified by geophysical survey on the site of a proposed solar farm at Manston Airfield	Site		
TR 36 NW 55	FS	Palaeolithic flint implement, surface find from Telegraph Hill, Minster, Thanet	Findspot	500000 BC to 40001 B	Lower Palaeolithic to Middle Palaeolithic
TR 36 NW 551	FS	Flint flake and pleistocene geological sequence, The Loop, Manston			
TR 36 NW 551	FS	Flint flake and pleistocene geological sequence, The Loop, Manston			
TR 36 NW 666	BLD	Second World War semi-sunken brick building, located on Windsor Road.	Building	1944 AD to 2050 AD	Modern
TR 36 NW 71	MON	Possible post-medieval field boundary, in fields near Vincent Farm, Margate	Field boundary?	1540 AD to 1900 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 NW 72	MON	Cropmarks of possible graves, near Monkton Road, Margate	Grave?		
TR 36 NW 80	MON	Cropmarks of enclosures, The Nook Hackthorn Farm, Margate	Enclosure		
TR 36 NW 81	MON	Ring ditch, Enclosure crop marks, Margate	Ring ditch, enclosure		
TR 36 NW 82	MON	Cropmarks of enclosure, Flete Farm, near Manston	Enclosure, ditch, pit	43 AD to 409 AD	Roman
TR 36 NW 83	MON	Cropmarks of enclosures, barrows & field systems, near Woodchurch	Enclosure		
TR 36 NW 84	MON	Enclosure and barrow cropmarks, Minster, Thanet	Enclosure, barrow	4000 BC to 1065 AD	Early Neolithic to Early Medieval or Anglo-Saxon
TR 36 NW 85	MON	Bronze Age barrows, near Mount Pleasant, Minster, Thanet	Barrow, pit	2350 BC to 701 BC	Bronze Age
TR 36 NW 86	MON	Enclosure cropmarks, Mount Pleasant, Minster parish	Enclosure		
TR 36 NW 92	MON	Enclosure cropmark, Manston, Minster parish	Enclosure		
TR 36 SE 17	MON	Enclosure cropmark and sub circular feature, Ramsgate	Enclosure, grubenhaus?	4000 BC to 42 AD	Later Prehistoric
TR 36 SE 20	MON	Cropmark ring ditches, Ramsgate, Thanet	Ring ditch, ring ditch, barrow	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon
TR 36 SE 21	MON	Ring ditch cropmarks, Ramsgate	Ring ditch		
TR 36 SE 210	MON	Early iron age pit discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 401 BC	Early Iron Age
TR 36 SE 22	MON	Ring ditch cropmarks, Ramsgate	Ring ditch		
TR 36 SE 23	MON	Ring ditch and possible Anglo-Saxon barrow, Ramsgate	Barrow, ring ditch, ring ditch	2350 BC to 1065 AD	Early Bronze Age to Early Medieval or Anglo-Saxon

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SE 25	MON	Area cropmark features, Ramsgate	Site		
TR 36 SE 26	MON	Medieval rems	Pit	1066 AD to 1539 AD	Medieval
TR 36 SE 31	MON	Slit trench cropmark, Ramsgate	Slit trench	1939 AD to 1945 AD	Modern
TR 36 SE 319	MON	Neolithic pit, Chalk Hill	Pit	4000 BC to 2351 BC	Neolithic
TR 36 SE 320	MON	Roman inhumation, Cliffsend	Inhumation	43 AD to 409 AD	Roman
TR 36 SE 336	MON	Possible location of Grubenhaus, Pegwell, near Ramsgate	Pit, grubenhaus		
TR 36 SE 342	MON	Late Neolithic/Early Bronze Age inhumation burial, Harbour Approach Road, Ramsgate	Crouched inhumation	3000 BC to 1501 BC	Late Neolithic to Early Bronze Age
TR 36 SE 35	MON	Medieval well shaft	Well	1066 AD to 1539 AD	Medieval
TR 36 SE 37	FS	Romano-British coins brooch and key	Findspot	43 AD to 409 AD	Roman
TR 36 SE 42	MON	Probable Bronze Age barrow, Little Cliffs End, Ramsgate	Barrow, ring ditch, pit	2350 BC to 701 BC	Bronze Age
TR 36 SE 463	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 464	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 465	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 470	BLD	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 48	FS	Iron Age coin	Findspot	800 BC to 42 AD	Iron Age
TR 36 SE 483	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SE 572	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SE 659	MON	Roman features, Cliffsend	Pit, feature	43 AD to 409 AD	Roman
TR 36 SE 683	MON	Late Bronze Age/Early Iron Age pits and ditch/possible enclosure, Chalk Hill	Pit, enclosure?	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SE 685	MON	Late Iron Age feature, Chalk Hill	Feature	25 AD to 75 AD	Late Iron Age to Roman
TR 36 SE 686	MON	Anglo Saxon inhumation, Chalk Hill	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SE 687	MON	Two undated pits/post holes, Chalk Hill	Pit?		
TR 36 SE 688	MON	Remains of an undated ditch, Chalk Hill	Ditch?		
TR 36 SE 716	MON	Early medieval shell midden, Pegwell Bay	Shell midden, pit	670 AD to 910 AD	Early Medieval or Anglo-Saxon
TR 36 SE 720	MON	An undated feature with a shell midden, Cliffs End	Feature, shell midden		
TR 36 SE 733	MON	Amorphous cropmark of possible infilled chalk pit	Chalk pit?	1540 AD to 1860 AD	Post Medieval
TR 36 SE 735	MON	Parallel cropmarks of a curving linear feature with a possible bank and ditch encompassing features to the south	Linear feature		
TR 36 SE 737	MON	Neolithic pits containing struck flints and early neolithic pottery discovered during the East Kent Access Route excavations (2009-2011)	Pit	4000 BC to 3001 BC	Early Neolithic
TR 36 SE 738	MON	Late iron age enclosure and features discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, pit	100 BC to 42 AD	Late Iron Age
TR 36 SE 739	MON	Anglo-Saxon cemetery and pits discovered during the East Kent Access Route excavations (2009-2011)	Cemetery, inhumation, grave, pit, hearth	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SE 753	LB	Eastern of two Concrete Second World War 4-inch gun	Coast battery gun site	1940 AD to 2050 AD	Modern

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
		emplacements, Little Cliffsend Farm			
TR 36 SE 754	BLD	Western 4-inch gun emplacement, Little Cliffsend Farm	Coast battery gun site	1940 AD to 2050 AD	Modern
TR 36 SW 100	FS	Neolithic flints, potin coins, prehsitoric pottery and Romano-British tiles, Abbey farm, Minster	Findspot	4000 BC to 409 AD	Early Neolithic to Roman
TR 36 SW 106	MON	Undated crouched inhumation burial, Cliffsend, Ramsgate	Crouched inhumation		
TR 36 SW 110	MON	Foxborough lane brickfield, Minster	Brickworks	1540 AD to 1908 AD	Post Medieval to Modern
TR 36 SW 111	MON	Site of Cliffsend Crossing chalk pit	Chalk pit	1540 AD to 1858 AD	Post Medieval
TR 36 SW 1123	MON	Possible ring-ditch, 50m diameter, north of Telegraph Hill	Ring ditch		
TR 36 SW 123	MON	Romano-British ditches, sunken featured building, two cemetries and pit containing prehistoric pottery	Ditch, pit, post hole, cremation cemetery, cremation cemetery	43 AD to 409 AD	Roman
TR 36 SW 130	MON	Possible Bronze Age features, Cliffsend, Ramsgate	Ditch	900 BC to 600 BC	Late Bronze Age to Early Iron Age
TR 36 SW 134	MON	Six early Bronze Age round barrows, Cliffs End Farm	Round barrow, ring ditch, post built structure, inhumation?	2350 BC to 1501 BC	Early Bronze Age
TR 36 SW 137	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SW 138	MON	PILLBOX	Pillbox	1939 AD to 1945 AD	Modern
TR 36 SW 162	LB	53 AND 55 FOAD'S LANE	Site, house, house	1736 AD to 1737 AD	Post Medieval
TR 36 SW 171	LB	ROSE COTTAGE	Site, end jetty house	1550 AD to 1699 AD	Post Medieval
TR 36 SW 179	LB	BAY TREE COTTAGE	Site, house, date stone, plaque	1745 AD to 1785 AD	Post Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 180	LB	ROSE COTTAGE AND PANSY COTTAGE	Site, house, laundry, bakehouse	1700 AD to 1732 AD	Post Medieval
TR 36 SW 182	LB	PSALM COTTAGE	Site, house	1800 AD to 1832 AD	Post Medieval
TR 36 SW 183	LB	CHAPEL HOUSE	Chapel, house, site, chapel, house, house, undercroft	1300 AD to 2007 AD	Medieval to Modern
TR 36 SW 224	MON	Prehistoric occupation site, Clive Road, Cliffsend	Post hole, round house (domestic)	4000 BC to 42 AD	Later Prehistoric
TR 36 SW 229	MON	Anglo-Saxon Cemetery and possible feasting site, Cliffs End Farm	Inhumation cemetery, pit, ditch, beam slot?	500 AD to 850 AD	Early Medieval or Anglo-Saxon
TR 36 SW 230	MON	Late bronze age enclosure and other features found at Cliffs End Farm.	Ditch, enclosure, midden, post hole, palisade?	1000 BC to 800 BC	Late Bronze Age
TR 36 SW 231	MON	Disused gasometer behind Mission Room	Gas holder	1897 AD	Post Medieval to Unknown
TR 36 SW 232	MON	Medieval ditch and pit, Cliffs End Farm	Ditch, pit, tree throw	1066 AD to 1539 AD	Medieval
TR 36 SW 235	MON	Prehistoric ditch, Cliffs End	Ditch, post hole?	4000 BC to 42 AD	Later Prehistoric
TR 36 SW 236	MON	Undated ditch terminal or pit, Cliffs End	Ditch?		
TR 36 SW 237	MON	Bronze Age features, Cliffs End	Ditch, pit?	2350 BC to 701 BC	Bronze Age
TR 36 SW 24	MON	Iron Age burials (found 1959)	Burial	800 BC to 42 AD	Iron Age
TR 36 SW 241	MON	Cropmarks of a curvilinear feature and possible sub-rectangular enclosure, north of Cliffs End	Linear feature, subrectangular enclosure?		
TR 36 SW 279	CRA	ME109	Aircraft crash site, me109	1939 AD to 1945 AD	Modern
TR 36 SW 282	MON	Late Bronze Age/Iron Age ritual and mortuary site, Cliffs End Farm	Crouched inhumation, pit, enclosure,	1600 BC to 101 BC	Middle Bronze Age to Middle Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
			quarry?, funerary enclosure?, post hole, cremation		
TR 36 SW 288	FS	Bronze Age artefacts, Abbey Farm	Findspot	2350 BC to 701 BC	Bronze Age
TR 36 SW 289	MON	Thorne Farm chalk pit, near Cliffs End, Minster parish	Chalk pit	1540 AD to 1860 AD	Post Medieval
TR 36 SW 290	MON	Possible ring ditch, north of Cliffs End	Ring ditch?		
TR 36 SW 291	MON	Ring ditch, north of Cliffs End	Ring ditch		
TR 36 SW 292	MON	Possible ring ditch, north of Cliffs End	Ring ditch?		
TR 36 SW 297	MON	Ovate ring cropmark Minster	Feature		
TR 36 SW 297	MON	Possible circular cropmark, Thorne Cottages, Minster	Feature		
TR 36 SW 304	MON	Cropmark of sub-rectilinear ditched enclosure , c. 50 x 35m, east of Cliffsend Farm Cottages	Enclosure		
TR 36 SW 310	MON	Ditch visible as a cropmark topping a shallow rise	Ditch?		
TR 36 SW 312	MON	Cropmark shows rectangular enclosure with causeway entrance	Enclosure		
TR 36 SW 313	MON	Cropmark of a probable chalk pit, east of Thorne Farm	Chalk pit?		
TR 36 SW 314	MON	Cropmark of a probable small chalk pit, east of Thorne Farm	Chalk pit?		
TR 36 SW 317	MON	6 possible pits defined as cropmarks, located between Thorne Farm and St Augustine's Golf Course	Pit		
TR 36 SW 318	MON	Crop-mark anomaly suggesting area of disturbance on southern side of Thorne Farm	Feature		

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 323	MON	Curving cropmark probably defining an ovate ditched enclosure but NW side is not visible	Curvilinear enclosure		
TR 36 SW 326	MON	Cropmark indicating a ditch or gully that appears to define a trapezoidal enclosure located north of Cliffsend Farm Cottages	Ditch		
TR 36 SW 328	MON	Partial cropmark of a probable ring-ditch	Ring ditch	1540 AD to 1860 AD	Post Medieval
TR 36 SW 329	MON	Possible structure platform, Red Cottages, Minster	Building platform?		
TR 36 SW 33	MON	Bronze Age enclosure and ring ditch	Ditch, circular enclosure	2350 BC to 701 BC	Bronze Age
TR 36 SW 35	MON	Crouched Inhumation, Cliffs End	Crouched inhumation	2350 BC to 1501 BC	Early Bronze Age
TR 36 SW 361	MON	Neolithic activity north of Great Cliffsend Farm, discovered during East Kent Access Route excavations 2009-2011, zone 9	Pit, enclosure	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 SW 362	MON	Late bronze age well with possible wattle lining, discovered during East Kent Access Route excavations 2009-2011, zone 9	Well?	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SW 365	LND	Large palaeochannel discovered during the East Kent Access Route excavations (2009-2011)	Palaeochannel	500000 BC to 42 AD	Prehistoric
TR 36 SW 366	MON	Mesolithic tranchet axe discovered during the East Kent Access Route excavations (2009-2011)	Findspot	10000 BC to 4001 BC	Mesolithic
TR 36 SW 367	MON	Bronze Age activity discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, cremation burial	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 367	MON	Bronze Age activity discovered during the East Kent Access Route excavations (2009-2011)	Ditch, pit, cremation burial	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 367	MON	Iron Age ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	800 BC to 42 AD	Iron Age

Referen ce ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 367	MON	Iron Age ditches, enclosures and post-built structures discovered during the East Kent Access Route excavations (2009-2011)	Ditch, enclosure, post built structure	800 BC to 42 AD	Iron Age
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 370	MON	Roman ditches, enclosures and boundary ditches discovered during the East Kent Access Route excavations (2009-2011)	Field system, boundary ditch, post built structure, enclosure	43 AD to 409 AD	Roman
TR 36 SW 371	MON	Anglo-Saxon sunken featured buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 371	MON	Anglo-Saxon sunken featured buildings discovered during the East Kent Access Route excavations (2009-2011)	Grubenhaus	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 372	MON	Medieval ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	1066 AD to 1539 AD	Medieval

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 373	FS	Small assemblage of residual early prehistoric finds discovered during the East Kent Access Route excavations (2009-2011)	Findspot	4000 BC to 701 BC	Early Neolithic to Late Bronze Age
TR 36 SW 374	FS	Small bronze age agricultural settlement discovered during the East Kent Access Route excavations (2009-2011)	Gully, pit, ditch, cremation burial, cenotaph?	2350 BC to 701 BC	Bronze Age
TR 36 SW 374	MON	Middle to late iron age settlement discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, gully	400 BC to 42 AD	Middle Iron Age to Late Iron Age
TR 36 SW 376	MON	Middle to late iron age settlement discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, ditch, gully, post hole, hollow way	800 BC to 42 AD	Iron Age
TR 36 SW 377	MON	Romano-British burials and cremations discovered during the East Kent Access Route excavations (2009-2011)	Inhumation, cremation	800 BC to 409 AD	Early Iron Age to Roman
TR 36 SW 378	MON	Romano-British ditches and hollow way discovered during the East Kent Access Route excavations (2009-2011)	Hollow way, ditch, pit	800 BC to 409 AD	Early Iron Age to Roman
TR 36 SW 379	MON	Bronze Age double ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 SW 380	MON	Bronze Age ring-ditch discovered during the East Kent Access Route excavations (2009-2011)	Ring ditch	2350 BC to 701 BC	Bronze Age
TR 36 SW 382	MON	Prehistoric palisade, discovered during the East Kent Access Route excavations (2009-2011)	Palisade	2350 BC to 101 BC	Early Bronze Age to Middle Iron Age
TR 36 SW 384	MON	Middle iron age pits, trapezoidal enclosure, sunken feature building discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, grubenhaus, pit, post built structure, post hole	400 BC to 101 BC	Middle Iron Age
TR 36 SW 385	MON	Middle iron age pits west of the trapezoidal enclosure discovered	Pit, post built structure, inhumation	400 BC to 101 BC	Middle Iron Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
		during the East Kent Access Route excavations (2009-2011)			
TR 36 SW 385	MON	Middle iron age pits south of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit	400 BC to 101 BC	Middle Iron Age
TR 36 SW 386	MON	Middle iron age pits east of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit	400 BC to 101 BC	Middle Iron Age
TR 36 SW 387	MON	Middle iron age features north of the trapezoidal enclosure discovered during the East Kent Access Route excavations (2009-2011)	Pit, quarry, animal burial, fence?	400 BC to 101 BC	Middle Iron Age
TR 36 SW 388	MON	At least one Anglo-Saxon inhumation discovered during the East Kent Access Route excavations (2009-2011)	Inhumation	410 AD to 1065 AD	Early Medieval or Anglo-Saxon
TR 36 SW 389	MON	Early iron age pits discovered during the East Kent Access Route excavations (2009-2011)	Pit	800 BC to 401 BC	Early Iron Age
TR 36 SW 390	MON	Roman sunken-featured buildings and pits discovered during the East Kent Access Route excavations (2009-2011)	Pit, grubenhaus, oven?, post hole, stake hole, ramp	400 BC to 409 AD	Middle Iron Age to Roman
TR 36 SW 390	MON	Roman sunken-featured buildings and pits discovered during the East Kent Access Route excavations (2009-2011)	Pit, grubenhaus, oven?, post hole, stake hole, ramp	400 BC to 409 AD	Middle Iron Age to Roman
TR 36 SW 391	MON	Post-medieval chalk quarry discovered during the East Kent Access Route excavations (2009-2011)	Quarry	1540 AD to 1900 AD	Post Medieval
TR 36 SW 393	MON	Late bronze age and early iron age ditches and D-shaped double-ditched enclosure discovered during the East Kent Access Route excavations (2009-2011)	Enclosure, trackway, ditch	1000 BC to 401 BC	Late Bronze Age to Early Iron Age
TR 36 SW 395	MON	Roman enclosures, pits and ditches discovered during the	Enclosure, pit	43 AD to 409 AD	Roman

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
		East Kent Access Route excavations (2009-2011)			
TR 36 SW 399	MON	Post-medieval chalk quarries discovered during the East Kent Access Route excavations (2009-2011)	Chalk pit	1801 AD to 1899 AD	Post Medieval
TR 36 SW 400	MON	Probable iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, field system?	800 BC to 42 AD	Iron Age
TR 36 SW 400	MON	Pit containing neolithic pottery discovered during the East Kent Access Route excavations (2009-2011)	Pit	4000 BC to 2351 BC	Neolithic
TR 36 SW 401	MON	Two small pits, each containing a middle bronze age pot, discovered during the East Kent Access Route excavations (2009-2011)	Pit	1600 BC to 1001 BC	Middle Bronze Age
TR 36 SW 402	MON	Middle bronze age to early iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Pit, ditch, field system	1600 BC to 401 BC	Middle Bronze Age to Early Iron Age
TR 36 SW 404	MON	Iron age field system discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, field system, pit, trackway	400 BC to 409 AD	Middle Iron Age to Roman
TR 36 SW 405	MON	Roman ditches discovered during the East Kent Access Route excavations (2009-2011)	Ditch	43 AD to 409 AD	Roman
TR 36 SW 405	MON	Roman ditches, gullies, pits and cremations discovered during the East Kent Access Route excavations (2009-2011)	Ditch, gully, pit, cremation	43 AD to 409 AD	Roman
TR 36 SW 406	MON	Late bronze age enclosure - the 'Central enclosure', Cliffs End Farm	Enclosure, pit, ditch	1000 BC to 800 BC	Late Bronze Age
TR 36 SW 407	MON	Late bronze age enclosure - the 'southern enclosure', Cliffs End Farm	Enclosure	1000 BC to 800 BC	Late Bronze Age

Reference ID	Record Type	Name	Monument type	Date Range	Period Range
TR 36 SW 408	MON	Probable Second World War concrete slab, part of an anti-aircraft battery, Cliffs End Farm	Anti aircraft gun emplacement?	1939 AD to 1945 AD	Modern
TR 36 SW 58	MON	Prehistoric barrows, enclosures etc found north of Bethlehem Farm, Minster, Thanet	Barrow, enclosure, henge?, farmstead?, field system, inhumation, ditch, pit	4000 BC to 42 AD	Later Prehistoric
TR 36 SW 88	MON	Ring ditch cropmark, Minster	Ring ditch		
TR 36 SW 97	MON	Rectilinear cropmark enclosure, Thorne hill, Minster	Rectilinear enclosure, linear feature, pit		
TR 36 SW 99	MON	Undated archaeological features, Beech Grove, Ramsgate	Ditch, pit, post hole, hearth		
TR36 NW 1248	MON	?Ammunition WWII store			

Appendix 9.4

Gazetteer of archaeological events (HER) within the study area

Event ID	Record Type	Name	Organisation	Date	Event type
EKE3995	EVT	Thanet Gas Pipeline, Phase 1	Site owner	1971	Excavation
EKE3995	EVT	Thanet Gas Pipeline, Phase 1	Site owner	1971	Excavation
EKE4847	INT	Desk based assessment of the Kent International Business Park	Trust for Thanet Archaeology	1996	Desk based assessment
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE4199	EVP	Monkton Gas Pipeline: Phases III - IV	(Isle of) Thanet Archaeological Unit	1984	Evaluation
EKE13405	INT	Margate and Broadstairs Urban Wastewater Treatment Scheme excavation phase	Wessex archaeology	2005/6	Excavation
EKE13406	INT	Watching brief during pipe installation, Margate to Broadstairs (2005)	Wessex archaeology	2005	Excavation
EKE15385	INT	Watching brief conducted at Crabapple Farm Stables, Woodchurch Road, Birchington, Kent.	Trust for Thanet Archaeology	2016	
EKE13134	NON	Survey of a Second World War air raid shelter, Manston Airport	Kent underground research group	2004	Field survey
EKE5692	INT	Watching Brief on Margate & Broadstairs WTW Enhancement Scheme	Wessex archaeology	2000	Watching brief

Event ID	Record Type	Name	Organisation	Date	Event type
EKE5692	INT	Watching Brief on Margate & Broadstairs WTW Enhancement Scheme	Wessex archaeology	2000	Watching brief
EKE8121	INT	Monkton to Mount Pleasant (A253 Duelling)	Canterbury archaeological trust	1994 - 1999	Excavation
EKE8121	INT	Monkton to Mount Pleasant (A253 Duelling)	Canterbury archaeological trust	1994 - 1999	Excavation
EKE8122	INT	Evaluation at Laundry Road, Minster	Isle of Thanet Archaeogical Unit	1995	Evaluation
EKE8123	INT	Excavation of a Beaker Burial From Manston	Isle of Thanet Archaeogical Unit	1987	Excavation
EKE12956	INT	Excavations of an Iron Age pit and a Roman cave, Spratling Court Farm chalk pit, Manston	Colin A. Baker	1996-2007	Excavation
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE12790	NON	Building survey of buildings at Manston Court Farm	Holt and Wooton Ltd	2004	Building survey
EKE8863	INT	Watching brief at Manston Court Farm, Manston, Thanet	Canterbury archaeological trust	2004	Watching brief
EKE13054	INT	Watching brief at Bradgate Caravan Park, Manston Court Road, near Manston	Trust for Thanet Archaeology	2010	Watching brief
EKE8342	INT	Evaluation on Land Adjacent to No.6 Laundry Road, Minster, Thanet	Trust for Thanet Archaeology	1996	Evaluation
EKE8386	INT	Chalk Hill palaeoenvironmental assessment (geotechnical survey)	Archaeoscape Consulting	1997	Borehole survey
EKE8388	INT	Excavation at Kent International Park, Manston 1997	Trust for Thanet Archaeology	1997	Excavation
EKE8420	INT	Evaluation at Ramsgate Harbour Approach Road, Ramsgate	Canterbury archaeological trust	1997	Evaluation

Event ID	Record Type	Name	Organisation	Date	Event type
EKE13190	NON	Survey of features in the cliffface, Pegwell Bay	A j daniels	1992	Field survey
EKE12156	INT	Watching brief on land adjacent to Martrice, Windsor Road, Cliffsend	Trust for Thanet Archaeology	2012	Watching brief
EKE11465	INT	Geotechnical work at Manston Airport	Foundation and Exploration Services	1999	Geotechnical survey
EKE12183	NON	Desk based assessment of the proposed wind turbine installation at the Tesco Superstore, Manston	Trust for Thanet Archaeology	2008	Desk based assessment
EKE13950	INT	Erection of a detatched bungalow, land adjacent to Bay View, Windsor Road, Ramsgate, Kent	Trust for Thanet Archaeology	2014	Watching brief
EKE12141	INT	Watching brief on land adjacent to 19 Mount Green Avenue, Cliffsend	Trust for Thanet Archaeology	2007	Watching brief
EKE11565	NON	Desk based assessment of Oaklands Nursery site, Cliffsend	Trust for Thanet Archaeology	1998	Desk based assessment
EKE11819	INT	Geotechnical survey at Westwood Industrial Estate, Manston Road, Ramsgate	Kent site investigation ltd	1993	Geotechnical survey
EKE11851	INT	Watching brief at Bradgate Caravan Park, Manston Court Road, Margate	Trust for Thanet Archaeology	2002	Watching brief
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey

Event ID	Record Type	Name	Organisation	Date	Event type
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE11900	INT	Geotechnical survey at the proposed NHS Medical Centre, Manston Road, Ramsgate	Ashdown site investigation ltd	2003	Geotechnical survey
EKE12049	NON	Desk based assessment of a proposed EDF Substation, Manston	Museum of London Archaeology	2004	Desk based assessment
EKE12055	NON	Survey of buildings at Grove Farm, Manston	Trust for Thanet Archaeology	2004	Building survey
EKE12117	NON	Desk based assessment of land at Spratling Court Farm, Spratling Street, Manston	Trust for Thanet Archaeology	2005	Desk based assessment
EKE12291	NON	Building survey of a pillbox on Manston Road allotments, Ramsgate	The historic environment consultancy	2007	Building survey
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief

Event ID	Record Type	Name	Organisation	Date	Event type
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12316	INT	Watching brief on geotechnical test pits on the East Kent Access route	Trust for Thanet Archaeology	2008	Watching brief
EKE12477	INT	Watching brief on an extension to the Reclamet Recycling Centre, Woodchurch Road, Woodchurch	Trust for Thanet Archaeology	2006	Watching brief
EKE12835	INT	Watching brief at Columbus Avenue, Manston Park	Swale and Thames Archaeological Survey Company		Watching brief, evaluation
EKE13030	INT	Watching brief of land south of Great West Autos, Manston Court Road, Ramsgate	Swale and Thames Archaeological Survey Company	2013	Watching brief
EKE13300	NON	Desk based assessment of Thorne Farm	Wardell armstrong consulting group	2013	Desk based assessment
EKE13537	NON	A256 East Kent Access Route, Desktop Assessment	Oxford archaeology	2003	
EKE14830	INT	Two palaeolithic test-pits excavated at The Loop, Manston, 2013	University of Southampton	2013	Test pit
EKE14830	INT	Two palaeolithic test-pits excavated at The Loop, Manston, 2013	University of Southampton	2013	Test pit
EKE14878	INT	The Dump, Manston Road, Margate, Watching Brief	Trust for Thanet Archaeology		
EKE14991	NON	Little Cliffsend Farmhouse, Chalk Hill CT12 5HA, Statement of Heritage Significance	Architectural archaeology	2015	Building survey, desk based assessment

Appendix 9.5

EIA Significance on receptors

For the purpose of this assessment, magnitude of change assumes the absence of any mitigation measures.

Reference	Name	Magnitude of change	Heritage significance	EIA significance	Rationale
1004203	Enclosure and ring ditches sited 180m east-northeast of Minster Laundry	Low	High	Not significant	The airport is visible from this scheduled monument. There is potential for this asset to be associated with assets identified at the west end of the runway. The asset is positioned on a south-facing slope and the views south to the River Stour are most likely to have influenced the choice of location. Although within a 60dB noise contour (Figure 5), the setting of the site is not dependent on tranquillity. It lies adjacent to the A299 and the Minster Laundry industrial estate, and is currently subject to high levels of traffic noise. The asset is below ground and so light does not affect setting. Light from the adjacent Minster Laundry industrial estate is already a readily discernible element of the asset's night-time setting.
1004228	Anglo-Saxon Cemetery south of Ozengell Grange	Negligible	High	Not significant	Views towards the airport from this scheduled monument are obscured by vegetation. Situated on the ridge, it is the views south towards the sea which are more likely to have influenced the choice of location, rather than the views to the west. Although a cemetery within the 60dB noise contour, the age of the remains and current appearance as a cultivated field means that the setting of the site is not dependent on tranquillity. Tranquillity is in any case disturbed by its location between the railway and the A299/A256, adjacent to a busy roundabout. The asset is below ground and so light does not affect setting. It is also adjacent to a large residential area with associated light radiance.
1016850	Monastic grange and pre-Conquest nunnery at Minster Abbey	Negligible	High	Not significant	The scheduled monument with associated listed buildings is surrounded by walls and the built environment. There are no long distance views. It is located within the settlement of Minster, close to the station, with associated noise and light

					radiance. This detracts from the sense of seclusion and remoteness provided by the boundary walls. The site does not lie within the 60dB noise contour.
1014642	Saxon Shore fort, Roman port and associated remains at Richborough	Low	High	Not significant	The scheduled monument with associated listed buildings is located at 5km distance from the site. Long-distance views include the airfield andother large developments such as Thanet Earth. These views are inhibited by topography, as the ridgeline creates a plateau which screens much of the airport site. Maximum noise level contours at 60dB, even for the largest planes do not reach as far as Richborough Castle. The castle is subject to noise from the railway and the A256. The site is not usually open during night-time hours, and so long distance views of operational lighting at the airfield will not affect normal visitor experience.
1336669	Barn about 50 metres east of Ozengell Grange	Negligible	High	Not significant	There is no direct intervisibility between this Grade II* listed building and the airfield. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas. It does not lie within the 60dB noise contour.
1224593	Wayborough Manor	Negligible	High	Not significant	There is no direct intervisibility between this Grade II* listed building and the airfield. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas. It does not lie within the 60dB noise contour.
1224683	Cleve Court and Cleve Lodge	Low	High	Not significant	There is no direct intervisibility between this Grade II* listed building and the airfield. While lighting may be visible at distance through the foliage at certain times of year, this asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from a nearby industrial area. The grounds of Cleve Court and Cleve Lodge fall within the 60dB noise contour, but the buildings do not. While the setting is not dependent on tranquillity it may affect the sense of rural setting in

					part of the grounds. It does not affect the buildings.
1085377	Ozengell Grange	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1223803	Cheeseman's Farm	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1204244	Flete Lodge	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1085444	Barn at Preston Farm	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1224336	Chapel House	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1224339	Rose Cottage and Pansy Cottage	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and

					foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1224545	Tudor Cottage	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1266887	Way House and Wayborough House	Negligible	High	Not significant	This Grade II listed building does not lie within the 60dB noise contour and the view to the airfield is obscured by topography and foliage. While lighting may be visible at distance through the foliage at certain times of year, the asset will not be directly illuminated by airfield lighting and is currently indirectly subject to similar low levels of light pollution from nearby residential areas.
1224337	Psalm Cottage	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1266885	Rose Cottage	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1224499	Bay Tree Cottage	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1336626	Granary about 25m south of Manston Court Farmhouse	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1085443	Remains of Monastic Building	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of

					residential light pollution. It is not within the 60dB noise contour.
1336625	Manston Court and adjacent Wall	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1085442	Grove Farmhouse	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1085445	Barn at Manston Green	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1336624	Old Forge House	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1430779	Manston War Memorial	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1085409	53 and 55 Foad's Lane	Negligible	High	Not significant	The built environment obscures the view between this Grade II listed building and the airfield. It will not be directly lit by the airfield and is subject to local levels of residential light pollution. It is not within the 60dB noise contour.
1224448	Prospect Inn	Low	High	Not significant	Close to the airfield, visibility from Grade II listed Prospect Inn to the airfield is currently obscured by topography. Visibility of flights taking off from the airport will enhance setting given the historic links. Prospect Inn lies within the 60dB noise contour, but is adjacent to the A229, and so daytime noise is unlikely to have an adverse impact. The property will not be directly lit by the airport and is already affected by street lighting. Due to its function, any distant visible lighting associated with the airport would enhance the historic relationship.
1429581	Eastern of two Concrete Second	Negligible	High	Not significant	There is no visibility between the Grade II listed gun emplacement and the airfield due to topography,

	World War 4-inch gun emplacements				the built environment and distance. It does not lie within the 60dB noise contour.
TR 36 NW 881	T2 Hangar	High	Medium	Significant	Despite rebuilding during the 1980's, the original steel frame remains and could be considered to be of group significance with other WWII structures on and near the airfield. EIA Effects could be mitigated through reuse or recording.
TR 36 NW 882	Civil Control Tower	High	Low	Not significant	Relates to recent use of the airport and of little historic significance.
TR 36 NW 883	Crash Fire Station	High	Medium	Significant	Relates to the USAF use of the site and of group significance with TR36 NW894. As the structure is unsuitable for modern aviation use, an appropriate programme of building recording will be agreed to reduce the effects.
TR 36 NW 884	Mechanical Transport Hangar	High	Low	Not significant	Relates to recent use of the airport and is of little historic significance.
TR 36 NW 885	Aircraft Dispersal Bay	High	Medium	Significant	Relates to the WWII use of the site and is of group significance. As the structure is unsuitable for modern aviation use, an appropriate programme of building recording will be agreed to reduce the effects.
TR 36 NW 886	RAF Manston Control Tower	High	Medium	Significant	Of group significance, but diminished by extensive structural and cosmetic changes since WWII. EIA Effects could be mitigated through reuse or recording.
TR 36 NW 887	Office Building	High	Low	Not significant	Relates to recent use of the airport and is of little historic significance.
TR 36 NW 888	RAF Battle HQ	High	High	Significant	Relates to WWII use of the site and is of group significance. EIA Effects could be mitigated through reuse or recording.
TR 36 NW 889	Civil Terminal	High	Low	Not significant	The original USAF building was replaced by the current structure, which relates to recent use of the airport and is of little historic significance.
TR 36 NW 894	Royal Observer Corps Listening Post	High	Medium	Significant	Relates to the USAF use of the site and of group significance with TR36 NW883. EIA Effects could be mitigated through reuse or recording.
TR 36 NW 892	Runway	Negligible	High	Not significant	Initially constructed for WWII activity, it is of group significance with the other WWII assets. The runway is being retained and reused.

TR 36 NW 890	RAF Intelligence Hut	Low	Medium	Not significant	Offsite structure relating to WWII use of the site and of group significance.
TR 36 NW 1180	Subterranean WWI hangar	Low	Medium	Not significant	Offsite structure relating to WWI use of the site and of group significance.
TR 3476 6519	Semi-sunken Brick Building	Low	Low	Not significant	Offsite structure possibly relating to WWII use of the site and potentially of group significance. Potential for WWII group value is diminished by an uncertain construction date and purpose.
TR 36 NW 891	Former Married Quarters	Low	Medium	Not significant	Offsite structure of limited WWI and potentially also WWII group value due to uncertainty of alterations and private ownership. Positioned adjacent to the airfield, there is visibility of the airfield, it is within a 60dB noise contour and has the potential to be directly affected by construction and operational lighting. It is considered that the asset relates to historic aviation use, and that design measures to mitigate noise and lighting effects will reduce the magnitude of change to low, resulting in a not significant effect.
TR 36 NW 1062	Pillbox	High	Medium	Significant	Extant. Current condition unknown. Group value with WWII assets on the site. EIA effects could be mitigated through retention or recording.
TR 36 NW 405	Coin of Charles I found near Cheeseman's Farm, Minster	None	Low	Not significant	Artefact has been removed from site, but is suggestive of further activity.
TR 36 NW 244	Ring ditch cropmark feature, Manston aerodrome, Minster	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA Effects could be mitigated through investigation.
TR 36 NW 245	Ring ditch cropmark, Manston Aerodrome, Minster	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 373	Cropmark complex in Manston Airfield, Minster parish	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.
TR 36 NW 378	Linear cropmark system near alland grange	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.
TR 36 NW 332	One man air raid shelter, near the Spitfire Memorial, Manston	High	Medium	Significant	Current presence or condition unconfirmed. EIA effects could be mitigated through retention or recording.
TR 36 NW 507	Crash site of Hawker Typhoon IB	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.

TR 36 NW 382	Iron Age pit, Laundry Road, Minster parish	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 385	Elizabethan coin found near Cheeseman's Farm, Minster	None	Low	Not significant	Artefact has been removed from site, but is suggestive of further activity.
TR 36 NW 401	Undated ring ditch, north of Manston Airport, Minster parish	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.
TR 36 NE 54	Bronze Age round barrow, Manston	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 26	Iron Age coins found at an unknown location on the Isle of Thanet	None	None	Not significant	Artefacts have been removed and may not have been recovered from within the Order limits.
TR 36 NW 28	Roman coin hoard, Mount Pleasant, Minster	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 34	Site of barrow, near Cliffs End, Minster parish	None	Medium	Not significant	Feature has been excavated, but is suggestive of further activity.
TR 36 NW 35	Early Iron Age pits, near Cliffs End, Minster parish	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 86	Enclosure cropmarks, Mount Pleasant, Minster parish	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.
TR 36 NW 92	Enclosure cropmark, Manston, Minster parish	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.
TR 36 NW 182	Roman-British industrial/settlement site, Minster	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 175	Ring ditch and barrow cropmarks, near Mill House Hospital, Minster	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 193	Bronze blade and fragments, near A253, Minster	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 209	Roman industrial/occupation site, Minster	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 210	Enclosure and round barrow cropmarks, near Manston Airport, Minster	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 216	Early-medieval bead and iron knife, near A253, Minster	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.

TR 36 NE 2168	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1076	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1059	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1072	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1048	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1041	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1043	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 1047	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.
TR 36 NW 437	Manston Caves, a mid 18th century chalk mine	None	None	Not significant	Excavated in antiquity and may not have been within the Order limits
TR 36 NW 260	Douglas Havoc Mark I BB893	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 518	Second World War air raid shelter, Manston Airport	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 498	Anglo-Saxon silver early penny ('sceat'), Manston	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 499	Merovingian gold tremissis, Manston	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 447	Cropmarks of enclosures and a	High	Low	Not significant	Potential for feature of uncertain date based on aerial photographs.

	trackway, west of Manston				
TR 36 NW 448	Cropmark of a ring ditch, west of Manston	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 466	Bronze Age ditch, Manston Airport	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 467	Roman pit, Manston Airport	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 468	Medieval occupation, Manston Airport	None	Low	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 469	Early Iron Age to Roman pottery, Manston Airport	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 470	Late Bronze Age to Early Iron Age pottery, Manston Airport	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 471	Mid Saxon to medieval pottery, Manston Airport	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 487	Bronze age flints, Manston Court Road, Manston	None	Medium	Not significant	Artefacts have been removed from site, but are suggestive of further activity.
TR 36 NW 488	Possible Roman post holes, Manston Court Road, Manston	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 508	Crash site of Hawker Typhoon IB	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 509	Crash site of Consolidated B24J Liberator	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 510	Crash site of Consolidated B24H Liberator	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 512	Crash site of Bristol Blenheim	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 1086	Crash site of Supermarine Spitfire I	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 1087	Crash site of Supermarine Spitfire I	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 1088	Crash site of Messerschmitt Bf110D	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.

TR 36 NW 1089	Crash site of Messerschmitt Bf110D	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 1090	Crash site of Heinkel He 111H-2	Low	Medium	Not significant	Limited, if any, remains are likely to be in situ. Significance is related to the wartime phase of the site.
TR 36 NW 543	Cropmark of a ring ditch, to the east of Manston runway	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 544	Cropmark of a ring ditch, to the east of Manston runway	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 545	Cropmark of a ring ditch, to the east of Manston runway	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 546	East Kent Access route: Palaeolithic flake, found during excavations	None	High	Not significant	Artefact has been removed from site, but is suggestive of further activity.
TR 36 NW 55	Palaeolithic flint implement, surface find from Telegraph Hill, Minster, Thanet	None	High	Not significant	Artefact has been removed from site, but is suggestive of further activity.
MKE91767	Two windmills beneath Manston Airfield	High	Low	Not significant	Potential for post-medieval features based on historic maps.
TR 36 NW 1108	Former location of four boundary stones that do not follow the parish boundary	None	Low	Not significant	Features have been removed, but are suggestive of further activity.
TR 36 SW 1123	Possible ring-ditch, 50m diameter, north of Telegraph Hill	High	Medium	Significant	Potential for prehistoric feature based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 SW 405	Roman ditches, gullies, pits and cremations discovered during the East Kent Access Route excavations (2009-2011)	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 1176	Late iron age / early Roman settlement and enclosures, Manston Airport car-park	None	Medium	Not significant	Features have been excavated, but are suggestive of further activity.
TR 36 NW 1183	Former Second World War oil depot, Canterbury Road West, Ramsgate	None	Medium	Not significant	Feature since removed, but suggestive of further activity.
TR 36 NW 1059	Pillbox	None/High	Medium	Not significant/Significant	Presence and condition is unconfirmed, but suggestive of further activity. If extant, EIA effects could be mitigated through retention or recording.

TR 36 NW 1220	Trench system visible as crop marks	High	Medium	Significant	Potential for feature dated to the wartime phase of the site based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 1222	zig-zag trench system	High	Medium	Significant	Potential for feature dated to the wartime phase of the site based on aerial photographs. EIA effects could be mitigated through investigation.
TR 36 NW 1263	Klein-kampfanlage shown on 11.1940 Luftwaffe map.	None	Medium	Not significant	Feature since removed, but suggestive of further activity.
TR 36 NW 1264	'Munitions dump' shown on 11.1940 Luftwaffe map.	None	Medium	Not significant	Feature since removed, but suggestive of further activity.