RiverOak Strategic Partners

Updated 5.2-6 Environmental Statement Volume 6: Appendices 1.4 - 7.2 (Explanation and Tracked)

TR020002/D1/5.2-6T

Examination Document

Project Name:	Manston Airport Development Consent Order
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MANSTON AIRPORT DEVELOPMENT CONSENT ORDER

APPLICATION REF TR020002

ENVIRONMENTAL STATEMENT – VOLUME 6 – APPENDICES 1.4 – 7.2

EXPLANATION AND TRACKED CHANGE VERSION FOR DEADLINE 1

Explanation of changes

1. This document first sets out the changes that have been made to Volume 6 of the Environmental Statement (Examination Library reference APP-044) in response to the Examining Authority's comments in the Rule 6 letter (ref PD-005) and in response to comments made at the Preliminary Meeting on 9 January 2019 and Issue Specific Hearing on 10 January 2019.

Construction Environmental Management Plan

2. Application Document reference 'APP-044' has been amended to include the correct Construction Environmental Management Plan.

Revised matrices in Word format

3. Application Document reference 'APP-044' has been amended to reflect the full and accurate list of qualifying features of the designated sites in tracked changes to Appendices A – E within the Report to Inform the Appropriate Assessment (Appendix 7.1).

Descriptions of designated features

4. Application Document reference 'APP-044' has been amended to include Table 6.2a within Appendix 6.1, which details the designated features for each ecological receptor.

Full data sets for all pollutants

5. Application Document reference 'APP-044' has been amended to include full data sets for all pollutants referenced in Paragraph 6.8.6, Chapter 6 in Volume 1 of the ES (APP-033).

Report to Inform the Appropriate Assessment figures

6. Application Document reference 'APP-044' has been amended to include a copy of Appendix 7.1 including the figures.

Volume 6 Contents

Appendix 1.4
Manston Airport Abbreviations

Abbreviations	
AADT	Annual Average Daily Traffic
AAP	Area Action Plan
ACP	Airspace Change Process
AEDT	Aviation Environmental Design Tool
AEP	Annual Exceedance Probability
AEL	Associated Emission Levels
AGL	Airfield Ground Lighting
ALS	Abstraction Licensing Strategy
AOD	Above Ordnance Datum
APF	Aviation Policy Framework
APIS	Air Pollution Information System
APU	Auxiliary Power Units
AQO	Air Quality Objectives
AQMA	Air Quality Management Area
AQS	Air Quality Standards
ARP	Adaptation Reporting Power
ASAS	Airport Surface Access Strategy
ASB	Anti-social Behaviour
AST	Above Ground Storage Tanks
ATC	Air Traffic Control
BAP	Biodiversity Action Plan
BAT	Best Available Techniques
BEIS	Department for Business, Energy & Industrial Strategy
BFG	Bulk Fuel Installation
BGS	British Geological Survey
BHF	British Heart Foundation
BNL	Basic Noise Level

Abbreviations	
BOCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CAP	Civil Aviation Publications
CBC	Common Bird Census
CCC	Canterbury City Council
CCC ASC	Committee on Climate Change Adaptation Sub-Committees
CCG	Clinical Commissioning Groups
CCRA	Climate Change Risk Assessment
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CFA	Continuous Flight Auger
C6H6	Benzene
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CLR	Contaminated Land Report
CO	Conservation Officer
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
CoCP	Code of Construction Practice
COMAH	Control of Major Accident Hazards Regulation
COMEAP	Committee on the Medical Effects of Air Pollution
CPRE	Campaign to Protect Rural England
CRoW	Countryside and Rights of Way Act
CTMP	Construction Traffic Management Plan
CTR	London Control Zone
dB	Decibel
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DDC	Dover District Council
DFT	Department for Transport
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges

Abbreviations	
DOWT	Designing Out Waste Tool
DPH	Director of Public Health

Appendix 2.1

Technical Note:
38199 – Manston Airport DCO EIA – Fuel Farm Requirements and Options Appraisal

1. Introduction

This Technical Note has been produced in order to provide a summary of the high-level requirements for an airport fuel farm as part of the re-development of Manston Airport, and to provide an appraisal of the options as part of the fuel farm site selection.

This work will be used as part of the consideration of alternatives for a fuel farm that will inform discussions with important statutory consultees and eventually the Development Consent Order (DCO) application itself.

2. Needs Case

As part of the proposals to develop and re-open Manston Airport a fuel farm will be required that is capable of providing sufficient storage and operational capacity to meet the needs of the project including particularly the air traffic generated.

An air traffic forecast, which has been produced as part of the evolving DCO application, includes an assessment of the aviation fuel storage requirements for each year of operation. It is based on the forecast number of air traffic movements for both air freight and passenger aircraft.

The fuel storage requirements for airport year 20 (the maximum year of operation) are presented in **Table 2.1** below. This includes an assessment of the number of tanker deliveries needed per year and per day, assuming an average road tanker capacity of 38,000 litres to deliver the fuel required to support the airport operations.

Table 2.1 Manston Airport Fuel Storage Requirements

	Annual Volume (KLitres)	Total Storage (Litres)	Number Annual Road Deliveries	Road Daily Deliveries
Year 20	285,620	1,600,000	7,516	20.59

3. Manston Airport Fuel Farm Requirements

The following represents the requirements that have been defined by the developer and their supporting team to support the establishment of the fuel farm. These have been produced taking into consideration constructability, cost, operational, safety/risk and environmental factors.

3.1 Existing Infrastructure

Where it exists the airport fuel farm should re-use and/or adapt existing infrastructure. This will reduce the need for new infrastructure thereby likely having a cost benefit. This will also potentially be a more environmentally sustainable option.

In addition the re-use of existing infrastructure will also reduce the need for development elsewhere therefore reducing the 'land take' required as part of the Proposed Development and minimising Compulsory Purchase Order (CPO) requirements.

3.2 Sufficient Space and Capacity

As detailed in **Table 2.1,** the fuel farm should have sufficient space and capacity to meet the fuel storage requirements at airport year 20. This includes sufficient capacity for the storage of the fuel, but also for the parking of fuel delivery tankers, for the unloading of fuel deliveries and for the transfer of fuel to the fuel delivery bowsers (should such be used).

The site should also have sufficient space and capacity to allow for the design and operation of the fuel farm to adopt Best Available Techniques (BAT) and comply with all relevant standards, guidance and best practice.

The layout should comply with the requirements of industry good practice, for example HSG 176 and the EI Guidelines on environmental management for facilities storing bulk quantities of petroleum products and other fuels.

A sufficient buffer will be needed in tankage to meet operational availability targets.

3.3 Separate and/or Segregated Area and Access

For both safety and operational reasons it is important that the fuel farm is located in a separate (or segregated) part of the airport site, and that it also has its own separate (or segregated) access to other airport related traffic. For safety reasons, the tank farm area should:

- Minimise collision potential for tankers with pedestrians and other vehicles at the airport;
- Have sufficient segregation distances between the fuel tanker stands and fuel tanks to the fuel farm and airport boundary;
- Control of ignition sources in zoned areas (essential by regulation);
- Ideally have a dedicated road for tanker use (or if not should be able to have temporary barrier during unloading/loading); and
- Have easy access (no blockage/bottlenecks) for emergency vehicle access in case of fire.

3.4 Road Access

The current proposals are for the fuel farm deliveries to be via road tankers, with the average capacity of 38,000 litres per tanker. There are forecast to be an average of 20.59 deliveries per day during the maximum year of operation (year 20), which therefore equates to an average of 41.18 fuel tankers movements per day on the local highway network.

In addition to the fuel tankers the airport will also generate other road traffic movements for the air freight operations, passenger operations and for staff associated with the operation of the airport. The current proposals are that these traffic movements will utilise new and/or improved site accesses from the highways network via the Spitfire Way (B2190) and Manston Road (B2050). The airfreight cargo forecast includes an average of 178 HGV movements per day during the maximum year of operation (year 20).

Therefore it seems reasonable to, where possible, have fuel farm tanker traffic avoid using the same route as other Airport traffic. Albeit not an absolute requirements this is therefore something which is desirable.

In addition, and another advantage, is that a separate and/or segregated access will also allow for quick and easy access to the fuel farm for the emergency services in the case of an accident or incident at the fuel farm.

3.5 Landside/Airside Access

Currently it is being investigated whether fuel will be transported from the fuel farm to the refuelling area itself, which is of course located in the airside portion of the Airfield, by a hydrant or bowser. The Developer currently wants to leave both options open. Therefore, and because fuel tanker bowsers are not 'public road legal', the fuel farm must be located immediately adjacent to the Airfield to allow for fuel tanker bowsers direct access to the fuel farm.

3.6 Outside of Groundwater Source Protection Zone 1 (SPZ1)

The Environment Agency (EA) have defined Source Protection Zones (SPZ) around groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones, SPZ1, SPZ2 and SPZ3, with SPZ1 the closest to the groundwater source.

The latest guidance and position statements from the EA, The Environment Agency's approach to groundwater protect (March 2017), states that they '*will oppose any new development involving large-scale above or below ground storage of hazardous substances (as may occur at a chemical works or at a petrol filling station) within SPZ1*'.

Therefore, the location for the fuel farm should be outside of groundwater SPZ1 in order to comply with the current EA guidance and best practice.

3.7 Cost/Constructability

A requirement of the DCO is to show that the proposed development is both viable and sustainable, therefore the cost and constructability of the fuel farm will be key considerations. The cost of all of the required fuel farm infrastructure, as well as the ability of this infrastructure to be constructed and delivered as part of the proposed development will be a consideration in the selection of a site for the fuel farm.

3.8 Proximity to Aircraft Aprons/Stands and other Operational Considerations

The location and operation of the fuel farm should also be compatible with the operation of the airport, and not present undue or onerous restrictions on the safe and efficient operation of the airport. There should be easy access and egress for the fuel deliveries from the fuel farm to the aircraft on the aprons and stands, with minimal restrictions on the movement and delivery of the fuel.

Fuel farm should be positioned such that risk of aircraft collision with the fuel tank is reduced to as low as reasonably practicable. The position of the tank farm should also not impair take-off and landing.

3.9 Conclusions

The following represents a summary of the requirements that have been defined by the developer and their supporting team to support the establishment of the fuel farm.

- Existing fuel farm infrastructure;
- Sufficient space and capacity;
- Separate and/or segregated access;
- Road access;
- Landside/airside access;

- Outside of groundwater source protection zone;
- Costs and constructability; and
- Proximity to aircraft aprons/stands and other operational considerations.

4. Fuel Farm Options

As part of the development of the project proposals a number of alternative locations and options for a fuel farm at Manston Airport have been considered, in all cases the requirements, as outlined in Section 3 above, have been considered in relation to each fuel farm location and option.

The following location and options have been identified and considered, these include options to re-use existing facilities, and three options for a new fuel farm on site and an option for a new fuel farm off-site:

1. Expansion of Jentex site;
2. Re-use of former airport fuel farm;
3. New fuel farm option 1 – northern edge of airfield;
4. New fuel farm option 2 – north-western edge of airfield;
5. New fuel farm option 3 – north-eastern edge of airfield; and
6. Off-site fuel farm.

An outline description of each of the fuel farm options is presented below. The three potential locations for a new fuel farm have been chosen as representative of the possible locations for a fuel farm within the airport site rather than as the final locations.

4.1 Expansion of Jentex Site

The Jentex Fuel Oils Ltd site is a privately operated fuels provider that has operated from a location to the southeast of Manston Airport since 1966. Prior to 1966 the site was the main fuel farm for Royal Air Force (RAF) Manston. The site has a separate direct access from Canterbury Road West. Currently the site is separated from the airport via a security fence, however when previously part of the airport it did have direct airside access via a security gate.

Upgrades and improvements would be required in order to meet the airport operational needs for increased storage capacity, and to ensure that the new facility was upgraded to comply with BAT.

4.2 Re-use of Former Airport Fuel Farm

Prior to the closure of the airport the fuel farm was located on the Northern Grass, the part of the airport on the north side of the B2050 (Manston Road); this option would see the new fuel farm located on the same site. Access to the fuel farm for deliveries was from a slip road off of the B2050, The Northern Grass was not airside, and had no direct airside access, therefore fuel deliveries were required to cross the public highway (B2050) in order to gain airside access.

Upgrades and improvements would be required in order to meet the airport operational needs for increased storage capacity, and to ensure that the new facility was upgraded to comply with BAT.

4.3 New Fuel Farm Option 1

The area identified for a new fuel farm is located on the northern edge of the main airport site, in an area bounded by the B2050 (Manston Road) the north, the air freight handling facilities to the south, and the passenger terminal and apron to the east. Access to the fuel farm would be via the new proposed airport cargo facility access from the B2190 (Spitfire Way) and then via the internal access road. The site would be located airside.

As a new facility all of the infrastructure required for the fuel farm would be new.

4.4 New Fuel Farm Option 2

This area identified for a new fuel farm is located in the northwest of the main airport site, the fuel farm could be located adjacent to the new proposed airport cargo facility access from the B2190 (Spitfire Way). Access would be via this new airport cargo facility access, and the site would be located airside.

As a new facility all of the infrastructure required for the fuel farm would be new.

4.5 New Fuel Farm Option 3

This area identified for a new fuel farm is located in the northeast of the main airport site, the fuel farm could be located adjacent to the proposed location for the new fire training area. Access to the fuel farm would be via the new proposed airport cargo facility access from the B2190 (Spitfire Way). The site would be located airside.

As a new facility all of the infrastructure required for the fuel farm would be new.

4.6 Off-site Fuel Farm

During consultation with the EA over the requirements for an airport fuel farm they requested that consideration be given to locating the fuel farm off of the main airport site. For this option it will be assumed that a suitable location within 5km of the airport boundary can be found, and that the site will not be subject to any planning constraints that would prevent its use as a fuel farm.

5. Fuel Farm Options Appraisal

The following section provide an options appraisal for each of the proposed fuel farm options or locations against the requirements section on above in Section 3. The approach adopted is to review each of the options against the fuel farm requirements and identify how each options performs in relation to these requirements. A quantitative approach to assessment, e.g. a scoring matrix, has not been adopted as it is considered that a qualitative approach is more appropriate for the assessment of each option. Professional judgement has been used to assess each option.

5.1 Expansion of Jentex site

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	As much of the existing fuel farm infrastructure as possible will be reused; although the requirement to upgrade the facility to use BAT will limit the amount that can be reused. The buildings on the site, the car parks and the construction platform will be re-used, other infrastructure will be re-used depending on its suitability. The fuel farm will use an existing site that would otherwise not be suitable for any other airport related uses.	This option performs well as it will re-use and adapt existing infrastructure which will result in a cost saving for the project, and also reduce the need for some construction works. Using this site will free up other parts of the airport site development. This will help ensure that all of the development required as part of the proposal are located within the Manston Airport boundary, with no need for any off-site development or additional land-take.
Sufficient space and capacity	The existing fuel farm site covers approx. 1.75ha, and the Jentex site previously had storage and capacity beyond those needed for the current airport proposals.	This options perform well as the existing site has sufficient space to accommodate the infrastructure required for the fuel farm.

Fuel Farm Requirement	Proposal	Appraisal
Separate and/or segregated area and access	The fuel farm would be located in a separate part of the airfield segregated from all other airport operations. The site is south of the runway, and no other airport operations or activities are planned for south of the runway. The site is large enough to allow sufficient segregations between the fuel tanker stand, fuel tanks, airport boundary and other airport infrastructure. Access for deliveries from the road network would be via a separate dedicated fuel farm access from Canterbury Road West.	This option performs well and will be located away from other airport infrastructure and activities, with a segregated access.
Road access	There will be a separate dedicated access from Canterbury Road West, delivery tankers would use the same highways network as other airport traffic up to the junction between the A299/B2190 (Minster Roundabout). From here tankers would continue on the A299 and then Canterbury Road West.	This options performs very well as it segregates the fuel deliveries from other airport traffic at the Minster Roundabout. Traffic calming measures through Cliffsend also mean that the use of Canterbury Road West by other HGVs is also limited. The separate access will also allow for quick and easy access to the fuel farm in the case of an accident or incident.
Landside/airside access	The fuel farm will be on the main airport site and therefore have direct airside access for fuel bowsers.	This option performs well as fuel tanker bowsers will be able to gain direct access to the fuel farm from the airport site.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	The far eastern part of the existing Jentex site is within SPZ1, but the proposed fuel farm would all be located entirely outside of SPZ1.	Provided that the fuel farm is located on the west of the existing Jentex site this options performs well and complies with the current EA guidance.
Cost/constructability	There would be a cost saving in relation to the earthworks and earthmoving operations as much of the existing building platforms for the facility could be re-used. Some of the existing infrastructure, such as buildings and car parking areas, could also be reused. There is an added cost associated with the decommissioning of the existing Jentex facility (see below) that would need to be considered as part of the costs for this option.	This option performs well as a there will be the option to re-use some existing infrastructure, including the building platforms which will reduce the amount of earth moving required.
Proximity to aircraft aprons/stand and other operation considerations	This option will not create any restrictions on other airport operations due to the segregations of the fuel farm from other airport operations. The fuel tanker bowsers will have to cross the runway to pass from the fuel farm to the re-fuelling areas, but this will be controlled by the airport air traffic control. From there access to the aprons and stands would be via the taxiway network. The location of the fuel farm to the south of runway will not impair take-off or landing.	This option performs moderately as the site will be segregated from other airport operations so will not impact other operational activities, but the fuel tanker bowsers will require access across the runway. This will be controlled and restricted by the air traffic control, but with the forecast level of air traffic movements it could be managed.
Other considerations	Any of the existing Jentex fuel farm equipment which cannot be reused will be decommissioned and removed. A full site investigation will be undertaken and a programme of remediation agreed with the relevant stakeholders and consultees.	This option will have the additional benefit of removing the potential source of contamination from the existing Jentex fuel farm.

Overall this option performs well for the re-use of existing fuel farm infrastructure, including limiting the need for any additional land take, sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, separate and/or segregated access, road access from the public highway, landside/airside access, and cost and constructability, and meets all of the requirements for the airport fuel farm in these areas.

The operation of the fuel farm on this site would require the movement of the fuel tanker bowsers from the fuel farm to the aprons and stands to be managed and controlled, in particular as they cross the runway they will need approval and clearance from air traffic control. But this can be managed and accommodated within the operation of the airport.

This option is located outside of SPZ1, although part of the site is close to SPZ1, therefore the tanks and other sensitive infrastructure should be located as far from SPZ1 as possible on this site. The detailed design of fuel farm on this site should incorporate BAT, but additional assessment and modelling of the groundwater, and risk and safety associated with a fuel farm on this site should be undertaken. Regular risk reviews should be carried out through the detailed design process, and any recommendations for further risk reduction measures to achieve an 'as low are reasonably practicable' (ALARP) risk level should be incorporated.

5.2 Re-use of Former Airport Fuel Farm

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	As much of the existing fuel farm infrastructure as possible will be reused; although the requirement to upgrade the facility to use BAT will limit the amount that can be reused. Locating the fuel farm on the Northern Grass will limit the amount land available on the site for aviation related development on the Northern Grass.	This option performs moderately in the re-use and adaption of existing infrastructure; there will be the opportunity to reuse some existing infrastructure which will result in a cost saving for the project, and also reduce the need for some construction works. However locating the fuel farm on the Northern Grass will limit the amount land available on the site for aviation related development and potentially constrain future development on the airport site resulting in development pressures off-site.
Sufficient space and capacity	The existing fuel farm site will be large enough to accommodate the infrastructure for the fuel farm, if required there is also sufficient space to expand the fuel farm on the Northern Grass.	This options perform well as the existing site has sufficient space to accommodate the infrastructure required for the fuel farm.
Separate and/or segregated area and access	The fuel farm would be located on the Northern Grass which has been identified within the masterplan for aviation related development, but will not be airside. There would need to be a suitable segregation between the fuel farm and the other aviation related development on the Northern Grass. Access for deliveries from the road network would be via a separate dedicated fuel farm access. Delivery tankers would be segregated from other airport traffic.	This option performs moderately and will be located away from other airside airport infrastructure and activities, with a segregated access. However there would need to be a suitable segregation between the fuel farm and other development on the Northern Grass which may limit the area available for development.
Road access	There will be a separate dedicated access from the B2050 (Manston Road), but in order to access the site the delivery tankers would use the same highways network as other airport traffic.	This options does not meet the requirements as road tankers will use the same road network as other airport traffic, including the passenger traffic which will use the B2050 (Manston Road). In addition in order to gain access from the fuel farm to the main airport site the fuel tanker bowsers will also have to cross the B2050 (Manston Road).

Fuel Farm Requirement	Proposal	Appraisal
Landside/airside access	The fuel farm will be on the Northern Grass which will not be airside. Therefore there will be no direct access to the main airport site or airside access for fuel bowsers.	This option does not meet the requirements to provide direct airside access from the fuel farm.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	This site is outside of SPZ1.	This option perform well being located outside of SPZ1.
Cost/constructability	There would be a cost saving in relation to the earthworks and earthmoving operations as much of the existing building platforms for the facility could be re-used.	This option performs well as a there will be the option to re-use some existing infrastructure, including the building platforms which will reduce the amount of earth moving required.
Proximity to aircraft aprons/stand and other operation considerations	There will be no direct easy access from the fuel farm to the aprons and stands as the fuel farm will be located on the Northern Grass which is not airside. The fuel tanker bowsers will have to cross the B2050 (Manston Road), as these vehicles are not road legal there, therefore there would need to be a suitable internal road or route to provide access to the aprons and stands from the fuel farm. The location of the fuel farm on the Northern Grass will not impair take-off or landing.	This option performs moderately as the fuel farm will be segregated from other airport operations and will provide the most reduced risk of aircraft collision being located the furthest from the runway. However it may limit the operation of any aviation related development on the Northern Grass in the proximity of the fuel farm. However there will be restrictions on the delivery of fuel from the fuel farm to the aprons and stands. A solution to allow the fuel delivery bowsers to cross the public road would be needed, and the interaction of these movements with other users of the B2050 (Manston Road) would need to be managed.

Overall this option performs well for sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, is located outside of groundwater SPZ1, and for cost and constructability and meets all of the requirements for the airport fuel farm in these areas.

The options performs moderately against the requirements for reuse and adaption of existing infrastructure, separate and/or segregated area and access, and proximity to aircraft aprons/stand and other operation considerations. Whilst this option meets some of the requirements in these areas, it does not meet all of them.

The operation of the fuel farm on this site would require the movement of the fuel tanker bowsers from the fuel farm to the aprons and stands to be managed and controlled, in particular as they cross the runway they will need approval and clearance from air traffic control. But this can be managed and accommodated within the operation of the airport.

This option does not meet the requirements for road access, as the fuel deliveries will use the same road network as other airport traffic, or for landside/airside access, as it will not be located airside. Both of these requirements mean that there will be an increase in the interaction between the fuel deliveries and other traffic associated with the airport.

5.3 New Fuel Farm Option 1 – Northern Edge of Airfield

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	This option is for a new fuel farm, therefore there will be no re-use or adaption of existing infrastructure. The fuel farm will also be located on the main airport site alongside other airport infrastructure in the area	This option does not meet the requirement as all of the infrastructure for the fuel farm will be new. In addition the fuel farm may limit the land available for other development,

Fuel Farm Requirement	Proposal	Appraisal
	currently planned for the air freight handling operations.	either directly due to the land take of the fuel farm, or indirectly due to the requirements to maintain safe working distances between the fuel farm and other operations.
Sufficient space and capacity	The site is new, and subject to detailed design there would be sufficient space to allow the construction of the required infrastructure.	This option performs well as the option is for a new fuel farm which can be sited to accommodate the needs.
Separate and/or segregated area and access	The fuel farm would be located on the main airport site adjacent to other airport operations. The location is also close to parking area for the air freight operation and also the passenger terminal and aprons. The access would be the same as the main airport access for the air freight operations, and	This option does not meet the requirement as the access for fuel deliveries will be the same as for the air freight operations, and the fuel farm will be located alongside other airport infrastructure and operations. The fuel delivery tankers will be required to use the same internal road network as the vehicles associated with the freight operations.
Road access	The fuel delivery tankers will use the same highways network as other airport traffic, the A299, Minster Roundabout and B2190 (Spitfire Way).	This options does not meet the requirements as road tankers will use the same road network as other airport traffic.
Landside/airside access	The fuel farm will be on the main airport site and will be located airside.	This option performs well as it will be located on the main airport site with direct airside access.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	This site is outside of SPZ1.	This option perform well being located outside of SPZ1.
Cost/constructability	All of the infrastructure for this option would be new, although some of the earthworks required for this option would be required as part development of the airport taxiway, internal road and other developments in this part of the airport site.	This option performs moderately as all of the infrastructure required for this option is new.
Proximity to aircraft aprons/stand and other operation considerations	The area for this option is in close proximity to the passenger apron and stands, with a clear route from the fuel farm to the air freight apron and stands. The location of the fuel farm will not impair take-off or landing.	This option performs well as the fuel farm will have easy access to/from the apron and stands.
Other considerations	Dependant on the final location, layout and design this site may be in front of the museum quarter where the relocated RAF Manston and Spitfire & Hurricane Museums would be located.	Feedback from consultees on the plans for the museums indicates that there should still be a clear visual pathway from users of the museum to the runway. A fuel farm in this location may block any view

Overall this option performs well for sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, for landside/airside access, is located outside of groundwater SPZ1 and for proximity to aircraft aprons/stand and other operation considerations, and meets all of the requirements for the airport fuel farm in these areas.

The options performs moderately against the requirements for cost/constructability as all of the fuel farm infrastructure required will be new. However, some of the required works, such as the earthworks and construction of roads and parking areas, will be required as part of the other airport development in this part of the site.

This option does not meet the requirements for reuse and adaption of existing infrastructure, as all of the fuel farm infrastructure will be new, and it will potentially limit the space available for other airside development; for separate and/or segregated area and access, as the fuel farm will be located alongside other airport infrastructure and use the same access as other airport traffic; or for road access, as the fuel deliveries will use the same road network as other airport traffic.

5.4 New Fuel Farm Option 2 – North-Western Edge of Airfield

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	This option is for a new fuel farm, therefore there will be no re-use or adaption of existing infrastructure. The fuel farm will also be located on the main airport site alongside other airport infrastructure, and the fuel farm may limit the land available for other development, either directly due to the land take of the fuel farm, or indirectly due to the requirements to maintain safe working distances between the fuel farm and other operations.	This option does not meet the requirements as all of the infrastructure for the fuel farm will be new. In addition the fuel farm may limit the space available for other airport development.
Sufficient space and capacity	The site is new, and subject to detailed design there would be sufficient space to allow the construction of the required infrastructure.	This option performs well as the option is for a new fuel farm which can be sited to accommodate the needs.
Separate and/or segregated area and access	The fuel farm would be located on the main airport site adjacent to other airport operations. The location is also close to the main access to the airport for the air freight operations. The access would be the same as the main airport access for the air freight operations.	This option does not meet the requirements as the access will be the same as for the air freight operations. The fuel bowsers will be required to use the same internal road network as the vehicles associated with the freight operations.
Road access	The fuel delivery tankers will use the same highways network as other airport traffic.	This options does not meet the requirements as road tankers will use the same road network as other airport traffic.
Landside/airside access	The fuel farm will be on the main airport site and will be located airside.	This option performs well as it will be located on the main airport site with direct airside access.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	This site is outside of SPZ1.	This option performs well being located outside of SPZ1.
Cost/constructability	All of the infrastructure for this option would be new, although some of the earthworks required for this option would be required as part development of the airport taxiway, internal road and other developments in this part of the airport site.	This option performs moderately as all of the infrastructure required for this option is new.
Proximity to aircraft aprons/stand and other operation considerations	This option will be located in an area bounded by the main air freight access and internal road to the north, the air freight apron and stands to the east, and the main taxiway Alpha to the south. The area for this option is in close proximity to the main taxiway (Alpha), and the route from the fuel farm to the apron and stands would be along the taxiway. This would affect the operation of either the fuel farm or airport as aircraft would not be able to wait on the taxiway at the same time as fuel bowsers were moving. The location of the fuel farm will not impair take-off or landing, but as noted may affect the use of the taxiway.	This option performs moderately as the fuel farm will have easy access to/from the apron and stands. But the close proximity to taxiway Alpha and need of the fuel bowser to use the taxiway to access the refuelling areas will result in some operational restrictions.

Overall this option performs well for sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, for landside/airside access, is located outside of groundwater SPZ1, and meets all of the requirements for the airport fuel farm in these areas.

The options performs moderately against the requirements for cost/constructability as all of the fuel farm infrastructure required will be new, and for proximity to aircraft aprons/stand and other operation considerations. However some of the required works, such as the earthworks and construction of roads and parking areas, will be required as part of the other airport development in this part of the site. The fuel farm will have direct access to the aprons and stands, but the fuel farm is located adjacent to taxiway Alpha, which may place some operational restrictions on the fuel farm and other airport operations.

This option does not meet the requirements for reuse and adaption of existing infrastructure, as all of the fuel farm infrastructure will be new, and it will potentially limit the space available for other airside development; for separate and/or segregated area and access, as the fuel farm will be located alongside other airport infrastructure and use the same access as other airport traffic; or for road access, as the fuel deliveries will use the same road network as other airport traffic.

5.5 New Fuel Farm Option 3 – North-Eastern Edge of Airfield

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	This option is for a new fuel farm, therefore there will be no re-use or adaption of existing infrastructure. The fuel farm will also be located on the main airport site alongside other airport infrastructure in the area currently planned for fixed base of operations (FBO) facility, flight training school and the firefighting training area. The fuel farm may limit the land available for other development, either directly due to the land take of the fuel farm, or indirectly due to the requirements to maintain safe working distances between the fuel farm and other operations.	This option does not meet the requirements as all of the infrastructure for the fuel farm will be new. In addition the fuel farm may limit the space available for other airport development.
Sufficient space and capacity	The site is new, and subject to detailed design there would be sufficient space to allow the construction of the required infrastructure.	This option performs well as the option is for a new fuel farm which can be sited to accommodate the needs.
Separate and/or segregated area and access	The fuel farm would be located on the main airport site adjacent to other airport operations. The location is also close to parking area for the air freight operation and also the passenger terminal and aprons. The access would be the same as the airport for the FBO and flight training school	This option does not meet the requirements as the access for fuel deliveries will be the same as for the air freight operations. The fuel delivery tankers will be required to use the same internal road network as the vehicles associated with the freight operations.
Road access	The fuel delivery tankers will use the same highways network as other airport traffic and would enter the airport site from the same access as the passenger traffic from the B2050 (Manston Road).	This options does not meet the requirements as road tankers will use the same road network as other airport traffic, in particular the road tankers will be travelling on the same roads at the airport passengers.
Landside/airside access	The fuel farm will be on the main airport site and will be located airside.	This option performs well as it will be located on the main airport site with direct airside access.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	This site is outside of SPZ1.	This option perform well being located outside of SPZ1.

Fuel Farm Requirement	Proposal	Appraisal
Cost/constructability	All of the infrastructure for this option would be new.	This option performs poorly as all of the infrastructure required for this option is new.
Proximity to aircraft aprons/stand and other operation considerations	This option will be located in an area bounded by the B2050 (Manston Road) the north, the air freight handling facilities to the south, and the passenger terminal and apron to the east. The area for this option is in close proximity to the passenger apron and stands, with a clear route from the fuel farm to the air freight apron and stands. The location of the fuel farm will not impair take-off or landing.	This option performs well as the fuel farm will have easy access to/from the apron and stands.
Other considerations	The area identified for this option is the planned location for the airport fire training area, having been used for this purpose when the airport previously operated.	It is unlikely that approval would be granted to site the fire training area and fuel farm on the same part of the site. Therefore a new area would need to be identified for the fire training area.

Overall this option performs well for sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, for landside/airside access, is located outside of groundwater SPZ1, and for proximity to aircraft aprons/stand and other operation considerations, and meets all of the requirements for the airport fuel farm in these areas.

The options performs poorly against the requirements for cost/constructability as all of the fuel farm infrastructure required will be new.

This option does not meet the requirements for reuse and adaption of existing infrastructure, as all of the fuel farm infrastructure will be new, and it will potentially limit the space available for other airside development; for separate and/or segregated area and access, as the fuel farm will use the same access as other airport traffic; or for road access, as the fuel deliveries will use the same road network as other airport traffic.

5.6 Off-site Fuel Farm

Fuel Farm Requirement	Proposal	Appraisal
Existing infrastructure	This option is for a new fuel farm, therefore there will be no re-use or adaption of existing infrastructure. The fuel farm in this option will be located off-site, which will require additional land outside of the current project red-line boundary.	This option does not meet the requirements as all of the infrastructure for the fuel farm will be new, and it will require additional off-site land take.
Sufficient space and capacity	The site is new, and a site would be selected that would have sufficient space to allow the construction of the required infrastructure.	This option performs well as the option is for a new fuel farm which can be sited to accommodate the needs.
Separate and/or segregated area and access	As the fuel farm would be located off-site the location could be chosen to ensure sufficient separation from the other airport operation and infrastructure. A separated and dedicated access, with good access for emergency services, would be a key consideration in the site selection.	This option performs well as it would be located off-site away from other airport infrastructure with a separate access.
Road access	Dependant on the location the fuel delivery tankers may use the some of the same highways network as other airport traffic.	This performance of this option is dependent on the chosen location, but it is expected that a site will be chosen that limits the interactions on the public highway of fuel farm and other airport traffic.

Fuel Farm Requirement	Proposal	Appraisal
Landside/airside access	The fuel farm will be located off-site and therefore will not be located airside. Dependant on the location the method for the transfer of fuel from the storage tanks to the fuel bowsers would need to be established.	This option does not meet the requirement as it will be located off-site with no direct airside access.
Outside of Groundwater Source Protection Zone 1 (SPZ1)	This site is outside of SPZ1.	This option perform well being located outside of SPZ1.
Cost/constructability	All of the infrastructure for this option would be new, in addition there may be unknown costs and construction issues associated with the chose site.	This option performs poorly as all of the infrastructure required for this option is new.
Proximity to aircraft aprons/stand and other operation considerations	This option will be located off-site so will not affect other airport operations or activities. As the fuel farm will be located off-site it is not certain how the delivery of fuel to the aprons and stands will be achieved. If the site is within close proximity to the main airport site then a pipeline system could be utilised, although this would have additional costs, construction, risk & safety and environmental considerations. The chose site may limit the option to use fuel delivery bowsers, as they will need to use the public roads. The location of the fuel farm will not impair take-off or landing.	This option does not meet the requirements as it is located off-site with no easy access to/from the fuel farm for the fuel delivery bowsers that does not use the public roads.

Overall this option performs well for sufficient space and capacity for a fuel farm that incorporates a BAT compliant design, for landside/airside access, for separate and/or segregated area and access, for road access, and is located outside of groundwater SPZ1, and meets all of the requirements for the airport fuel farm in these areas.

The options performs poorly against the requirements for cost/constructability as all of the fuel farm infrastructure required will be new, in addition there maybe additional unknown and/or unforeseen costs and construction issues associated with the chosen site.

This option does not meet the requirements for reuse and adaption of existing infrastructure, as all of the fuel farm infrastructure will be new, landside/airside access, as the fuel farm will be located off-site with no direct airside access, or for proximity to aircraft aprons/stand as the fuel farm will be situated off-site with no easy access to the aprons and stands.

6. Summary and Conclusions

Each of the six options for the Manston Airport fuel farm have been assessed against the fuel farm requirements identified in Section 3.

6.1 Conclusions

The appraisal of the six identified that the adaptation of the Jentex site (Option 1) as the site for the Manston Airport fuel farm performs best against all of the requirements. This options performs well against six of the eight fuel farm requirements.

For proximity to aircraft aprons/stand and other operation considerations this option performs moderately well, the fuel farm will have easy access to the aprons and stands via the internal airport road network, but the fuel bowsers would be required to cross the runway. Movements across the runway, as is standard, would need to be managed and controlled by the air traffic control, this would place some restriction on the operation of the fuel farm. But these could be managed, and would not affect the efficient of the fuel farm.

Part of the Jentex site is located within SPZ1, but the site is large enough to ensure that the fuel farm can be located outside of SPZ1, therefore this option performs well against this requirement. It is recognised that addition work to look at the risks to groundwater and the SPZ is required, this would include more detailed design to identify potential embedded mitigation, additional groundwater modelling and update to Hydrogeological Risk Assessment, safety & risk studies of fuel farm design and an update of the Drainage Strategy with specific measures for the fuel farm.

The final detailed design of the fuel farm, and of the embedded mitigation, will be completed to recognise that due to the risks associated with the location it needs to go beyond standard practice and incorporate special measures.

Author

……………………………………………………………..
Oliver Gardner

Reviewer

……………………………………………………………..
Toby Gibbs

Appendix 3.1
Manston Airport Glossary

Term	Definition
Baseline	A study of existing Environmental Conditions.
Biofuels	Fuels produced from plant material.
Biodiversity	The concept of a variety in all species of plants and animals through which nature finds its balance.
CAT II/III operations	Category II and III runway operations refer to category of instrument landing systems (ILS) equipment which support the different categories of approach/landing operations. Category II is the minimum requirement to allow an airport to obtain EASA certification.
Carbon budget	The total quantity of greenhouse gas emissions permitted in the United Kingdom over a specified period.
Carbon dioxide equivalent	A measure used to compare the emissions from various greenhouse gases based on their global warming potential relative to that of carbon dioxide.
Carbon emission	The release of carbon into the atmosphere.
Climate change adaptation	The adjustment in natural or human systems in response to actual or expected climatic changes or their effects, which moderates harm or exploits beneficial opportunities.
Climate change mitigation	Action to reduce reducing the causes of climate change (e.g. emissions of greenhouse gases), as well as reducing future risks associated with climate change.
Climate change projections	Projections of changes in climate variables expressed in terms of the difference between the absolute future climate and a baseline climatology for a given location, time period and emissions scenario of greenhouse gases.
Climate change resilience	The capacity of both natural and human systems to keep their original form and function, and to survive and adapt in the context of the stresses and shocks imposed upon them by climate change.
Committee on Climate Change	An independent advisory body, established under section 32 of the Climate Change Act 2008, tasked with helping the UK Government set and meet carbon budgets and adapt to climate change.
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
Construction Phase	Activity taking place on site up until commissioning.
Cumulative Effects	The summation of effects that result from change caused by development in conjunction with other past, present or reasonably foreseeable actions.
Decibel	Noise is conventionally measured in decibels (dB). The ratio between the quietest audible sound and the loudest tolerable sound is a million

Term	Definition
	to one in terms of the change in sound pressure. Due to this wide range, a scale based on logarithms is used in noise level measurement. The scale used is the dB scale which extends from 0 to 140dB corresponding to the intensity of the sound pressure level.
Decibel(A)	“A Weighting” refers to the sound level that represents the human ear’s response to sound. The dB(A) unit is internationally accepted and has been found to correspond well with people’s subjective reaction to sound.
Dust	Generic term used to describe larger non-respirable airborne particulates (typically those which are deposited rapidly and normally associated with soiling / marking of property, cars, vegetation etc.).
Effect	A temporary or permanent consequence of a singular or collective impact associated with the proposal.
Embodied carbon	Carbon dioxide emitted during the manufacture, transport and construction of materials, together with end of life emissions.
Emerging baseline	Projected climate conditions at the site during the operational phase of the Proposed Development. The climate resilience and in-combination climate change impacts assessments are based on this.
Emissions scenario	Scenarios of how greenhouse gas emissions may vary in future. These are used by scientists to generate climate change projections.
Environment	Our physical surroundings including air, water and land.
Environmental Impact Assessment	An assessment undertaken to determine the potential impacts of a proposed development on various elements of the environment, such as on air quality and ecology and social issues such as socio-economics and transport.
Environmental Statement	The report of the Environmental Impact Assessment of a proposed development.
Extreme Weather Event	Unusual, severe or unseasonal weather; or weather at the extremes of the range of weather seen in the past.
Future Baseline	The situation that would occur if the proposed development that is the subject of the environmental impact assessment does not proceed. The predicted impacts of the development are compared against this theoretical scenario.
Greenhouse Gas	A gas such as carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone, and water vapour that contributes to the greenhouse effect by absorbing infrared radiation.
Habitat	Where a particular organism or population can be found.
In-combination climate change impacts	The impact of climate change and the Proposed Development on environmental receptors identified elsewhere in the ES.
Indirect Impacts	Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
Inset Thresholds	Light fittings used on runways.
Impact	Something which temporarily or permanently causes a change to the environmental baseline, whether adverse or beneficial, as a result of the proposals.
Land use	The primary use of the land, including both rural and urban activities.
L_{Aeq}	The notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted

Term	Definition
	fluctuating sound measured over that period. Values are sometimes written using the alternative dB(A) L_{eq}.
$L_{Aeq,16hr}$	The L_{Aeq} noise level from 0700 to 2300 and typically based on 'average summers day' for a 92-day period from mid June to mid September. The average summers day is traditionally considered the period when airports are busiest
$L_{Aeq,8hr}$	The L_{Aeq} noise level from 2300 to 0700 and typically based on 'average summers day' for a 92-day period from mid June to mid September.
L_{max}	The maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{A90,\ T}$	$L_{A90,\ T}$ index represents the sound level exceeded for 90% of the measurement period and is used to indicate quieter times during the measurement period. It is usually referred to as the background sound level.
$L_{A10,\ T}$	$L_{A10,\ T}$ refers to the level exceeded for 10% of the measurement period. $L_{A10,\ T}$ is widely used as a descriptor of road traffic noise.
Methodology	The specific approach and techniques used for a given study.
Mitigation	Any process, activity or entity designed to avoid, reduce, or remedy adverse environmental effects likely to be caused by a development project.
Nitrogen Monoxide	Clear, colourless gas produced by combustion process – not a primary air pollutant, but may be a contribution to photochemical processes giving rise to other pollutants, such as smog.
Nitrogen Dioxide	Reddish brown gas (in high concentrations), respiratory irritant and precursor to photochemical processes which produce other pollutants, photochemical smog and contribute to global warming.
Nitrous Oxide	Inert product of combustion, which does not contribute to local air pollution.
Non-Technical Summary	The 'executive summary' of an Environmental Statement prepared in non-technical language so that it can be read by the layman.
Nx	Nx or Number Above is the total number of aircraft operations that exceed a specified sound level threshold. For example N65 is the count of departure and arrival events in excess of 65 dB L_{Amax}.
Operational Phase	Standard operation after commissioning.
Paris Accord	An agreement within the United Nations Framework Convention on Climate Change (UNFCCC) that sets out a global action plan to mitigate greenhouse gas emissions and limiting global warming to well below 2°C, as well as strengthening the ability of countries to deal with the impacts of climate change.
PM_{10}	Particulate matter with a diameter of 10 microns or less (also referred to as micrometers or 1/1000th of a meter).
$PM_{2.5}$	As above, but 2.5 microns or less in diameter.
Potentially	Likely environmental effects.
Project	The indicative proposals and other changes which are to be undertaken.

Term	Definition
Rating level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Sound power levels (L_w)	Sound power levels (L_w) are used to describe the sound output of a sound source.
Receptors	A component of the natural or man-made environment such as water or a building that is affected by an impact.
Residual Impacts	Effects remaining after mitigation measures have been implemented
Scoping	An early stage within the Environmental Impact Assessment Process where the significance of environmental issues and scope of the environmental studies are determined.
Vibration	Vibration is an oscillatory motion. The magnitude of vibration can be defined in terms of displacement, i.e. how far from the equilibrium something moves, velocity (how fast something moves), or acceleration (the rate of change of velocity).
Visual Effect	The change in the appearance of the townscape as a result of the development. This can be positive or negative.

RiverOak Strategic Partners

Manston Airport DCO EIA

Appendix 3.2: Construction Environmental Management Plan

July 2018

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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Management systems

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Document revisions

No.	Details	Date
1	Draft 1st Issue	March 2018
2	Final 1st Issue	March 2018
3	Final 2nd Issue	July 2018

Abbreviations

Abbreviation	Term
ACP	Aerospace Change Procedure
AEP	Annual Exceedance Probability
AIP	Aeronautical Information Package
ALARP	As Low as Reasonable Practicable
APU	Auxiliary Power Unit
ASAS	Airport Surface Access Strategy
ATC	Air Traffic Control
ATM	Air transport Movements
AWSI	Archaeological Watching Scheme of Investigation
BMS	Biodiversity Mitigation Strategy
BPM	Best Practicable Means
CAA	Civil Aviation Authority
CDM	Construction Design and Management Regulations
CEM	Contractor Environmental Manager
CEMP	Construction Environmental Management Plan
CPD	Contractor Project Director
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DMP	Dust Management Plan
EA	Environment Agency
EASA	European Aviation Safety Agency
EIA	Environmental Impact Assessment
ECoW	Ecological Clerk of Works
ES	Environmental Statement
FEGP	Fixed Electrical Ground Power
GHG	Greenhouse Gas
GSE	Ground Support Equipment
HGV	Heavy Goods Vehicle
KCC	Kent County Council
NE	Natural England

NGR	National Grid Reference
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
OWMP	Outline Waste Management Plan
PICP	Pollution Incident Control Plan
PLO	Public Liaison Officer
PPE	Personal Protective Equipment
PRoW	Public Right of Way
PRoWMP	Public Right of Way Management Plan
RAF	Royal Air Force
RiverOak	RiverOak Strategic Partners
SHE	Safety, Health and Environment
SPZ	Source Protection Zone
SW	Southern Water
SWMP	Site Waste Management Plan
TA	Transport Assessment
TDC	Thanet District Council
UXO	Unexploded Ordnance
WWI	World War One
WWII	World War Two

Contents

Appendix A	CEMP Review Table
Appendix B	Draft of Register of Contents Legal Responsibilities
Appendix C	Emergency Contact Details Template

1. Introduction

1.1 General

1.1.1 This Construction Environmental Management Plan (CEMP) supports the application by RiverOak Strategic Partners (hereafter referred to as 'RiverOak') for development consent to reopen Manston Airport (the 'Proposed Development') as a new air freight cargo hub. The Proposed Development is a Nationally Significant Infrastructure Project (NSIP) under Part 3 of the Planning Act 2008[1] and therefore requires an application to be submitted for a Development Consent Order (DCO).

1.1.2 The environmental management of the construction works associated with the Proposed Development shall be delivered via the implementation of this CEMP. It outlines the environmental procedures that require consideration throughout the construction process in accordance with legislative requirements and construction industry best practice guidance. It aims to ensure that the adverse effects from the construction phase of the Proposed Development, on the environment and local communities, are minimised.

1.1.3 Environmental management measures associated with the operation of the Proposed Development shall be delivered via the implementation of a separate Operational Environmental Management Plan (OEMP). The only mitigation measures related to the operation of the Proposed Development included in this CEMP are those which are relevant to parts of the Proposed Development which will be operational before construction is completed.

1.1.4 The final CEMP will be implemented by RiverOak secured through the requirements of the DCO. This is a working document and revisions to this CEMP may be undertaken during the examination of the DCO Application.

1.1.5 The appointed contractor shall be responsible for safeguarding the environment and for mitigating the effects of the construction works by implementing general environmental requirements of the CEMP. RiverOak will ensure that the contractor(s) complies with the CEMP via contractual arrangements.

1.2 Project Location and Site Description

1.2.1 The Site, covering an area of approximately 296ha is on the existing site of Manston Airport, Kent, centred at National Grid Reference (NGR) 633173, 165710.

1.2.2 Presently, it comprises a combination of existing buildings and hardstanding, large expanses of grassland and some limited areas of scrub and/or landscaping. This includes the 2,748m long, 60m wide runway, which is orientated in an east-west direction across the southern part of the Site. The existing buildings are clustered along the east and north-west boundaries of the site.

1.2.3 The northern part of the Site is bisected by the B2050 (Manston Road), bounded by the A299 dual carriageway to the south and the B2190 (Spitfire Way) to the west. The existing site access is from the junction of the B2050 with the B2190.

1.3 An Overview of the Manston Airport Project

1.3.1 The Proposed Development involves the re-development of the existing Manston Airport into a dedicated air freight facility, which also offers passenger, executive travel and aircraft engineering services. It is expected to lead to an increase in airport capacity of at least 10,000 air transport movements (ATMs) of cargo aircraft than currently provided. As the Proposed Development is a NSIP, the application for development is undertaken as a DCO Application submitted to the Planning Inspectorate and decided by the Secretary of State.

1.3.2 Works to be undertaken consist of the following:

- Upgrade of Runway 28/10 to allow CATII/III operations;
- Realignment of the parallel taxiway;
- Construction of 19 EASA compliant Code E stands for air freight aircraft;
- Installation of new high mast lighting for aprons and stands;
- Construction of 65,500m² of cargo facilities;
- Construction of a new Air Traffic Control (ATC) tower;
- Construction of a new airport fuel farm;
- Existing fire station refurbishment/replacement;
- Complete fit-out of airfield navigational aids (nav-aids);
- Construction of new aircraft maintenance hangars;
- Development of the 'Northern Grass Area' for airport related business development;
- Demolition of the redundant 'old' ATC Tower;
- Safeguarding of existing facilities for museums on the site;
- Highway improvement works, both on and off-site; and
- Extension of passenger service facilities including an apron extension to accommodate an additional aircraft stand and doubling of the current terminal size.

1.4 Objectives of the CEMP

1.4.1 This CEMP provides an overarching framework for the environmental management procedure during the construction phase of the Proposed Development.

1.4.2 The objectives of the CEMP are as follows:

- To provide a mechanism for ensuring the delivery of environmental measures (other than those which will be secured through specific requirements of the DCO), to avoid, reduce or compensate for environmental effects identified in the Environmental Statement (ES);
- To provide an outline of the content that will be supplied in the detailed plans and schemes prior to construction of the relevant stage of works;
- To ensure compliance with legislation and identify where it will be necessary to obtain authorisation from relevant statutory bodies;
- To provide a framework for compliance auditing and inspection to ensure the agreed environmental aims are being met; and
- To ensure a prompt response to any non-compliance with legislative and DCO. Requirements, including reporting, remediation and any additional mitigation measures required to prevent a recurrence.

1.5 Structure and Content of the CEMP

1.5.1 The remainder of this CEMP is split into five further chapters:

1.5.2 **Chapter 2** describes the roles and responsibilities of those on site.

1.5.3 **Chapter 3** describes the Proposed Development construction, inclusive of:

- Construction programme;

- Working hours;
- Site compounds;
- Re-instatement of land; and
- Traffic management.

1.5.4 **Chapter 4** describes inspections, incident procedures and the general principles that will be adopted on the construction site. The general site operations cover the following elements:

- Inspections;
- Communication (on-site and external);
- Incident procedure;
- Health and safety;
- Waste management;
- Security;
- Welfare;
- Pest control;
- Invasive species management;
- Unexploded ordnance;
- Utility works;
- Consents and licences; and
- Legal and other requirements.

1.5.5 **Chapter 5** describes the environmental measures that will be adopted during the construction of the Proposed Development in accordance with the ES. The environmental measures will be implemented to avoid, reduce or compensate for effects on receptors identified in the following environmental topics:

- Air quality;
- Biodiversity;
- Freshwater environment;
- Historic environment;
- Land quality
- Landscape and visual impact;
- Noise;
- Socio-economic;
- Traffic and Transportation;
- Climate Change; and
- Major Accidents and Disasters.

1.5.6 This document is classified as a 'live document' and as such is required to be updated by the Contractor prior to the commencement of any construction related works or activities. An example CEMP Review Table is located within **Appendix A** of this report. Updates will take account of the following aspects:

- Changes to the design;
- Changes to external factors, including legislation;
- Unforeseen circumstances;
- Results from external audits and inspections; and
- Learning points from environmental near misses and incidents.

1.6 Accompanying Plans

1.6.1 The CEMP is accompanied by the plans and strategies shown in **Table 1.1**, which will either be submitted as part of the DCO application or follow on post submission:

Table 1.1 Management Plans

Plan/Strategy	Description	Responsible Party	Timeline
Emergency Plan	Details the incident alerting procedures and the initial action responsibilities for airport staff.	TBC	Post DCO consent
Dust Management Plan	Outlines appropriate management techniques that will reduce the potential for any dust-related adverse effect to public health or the environment.	The client (as agreed)	Post DCO consent
Outline Drainage Strategy	A report into how surface water, usually caused by rain, affects a site and the surrounding area.	Wood	For DCO submission
Emergency Response and Post-Crash Management Plan	Consolidated reference and action document for use of personnel in the event of a major incident or emergency.	The client / contractor (as agreed)	Post DCO consent
Pollution Incident Control Plan (PICP)	For use by all company personnel for the identification, notification, containment and clean-up of all spillages, both inside and externally of a building or on the airfield.	The client / contractor (as agreed)	Post DCO consent
Training Plan	Outlines details concerning the formal training that will be undertaken by all those on site. It will outline the objectives, needs and strategy.	The client / contractor (as agreed)	Post DCO consent
Construction Traffic Management Plan	Site specific plan that covers the design, implementation, maintenance and removal of any temporary traffic management measures on the surrounding road network while work or activity is carried out on a construction site.	Wood	For DCO submission
Travel Plan	A long-term management strategy for integrating proposals for sustainable travel into the planning process.	Wood	For DCO submission
Surface Access Strategy	This sets out how the airport will improve and encourage all the different ways that passengers,	Wood	For DCO submission

Plan/Strategy	Description	Responsible Party	Timeline
	staff and goods get to and from the airport and beyond.		
Car Park Strategy	Summarises the car parking requirements at the Proposed Development and the proposals.	Wood	For DCO submission
Public Rights of Way Management Strategy	Addresses the interactions between the Public Rights of Way (PRoW) and the Proposed Development, during the Construction phase.	Wood	For DCO submission
Wildlife Hazard Management Plan	Procedure to assess and manage the wildlife hazards on and in the vicinity of the aerodrome.	The client (as agreed)	Post DCO consent
Habitat Management Plan	Manage the habitat on the airport site in order to reduce the risks for bird strike.	The client (as agreed)	Post DCO consent
Outline Waste Management Plan (OWMP)	A strategy and action plan for the management of waste which is likely to arise during the construction phase of the proposed development.	RPS	Post DCO consent
Scheme of Investigation (AWSI)	Details the strategy and mitigation measures to be used to limit the impact on existing users of the public highway network.	Wood	Post DCO consent
Safety Health and Environment (SHE) Plan	Details relevant safety, health and environmental information relating to all land within the construction site.	Contractor's Health and Safety Advisor (as agreed with the client)	Post DCO consent
Communications Plan	A plan which formally defines who should be given specific information, when that information should be delivered and what communication channels will be used to deliver that information.	Contractor's Public Liaison Officer (as agreed with the client)	Post DCO consent

1.7 Conformance with the Environmental Statement

1.7.1 An Environmental Impact Assessment (EIA) has been undertaken for the Proposed Development. An ES has been prepared in accordance with the ***Infrastructure Planning (EIA) Regulations 2017*** (the 2017 Regulations)[2]. The ES includes assessments of the likely significant effects on the environment that are likely to be caused during the construction and operation phases of the Proposed Development.

1.7.2 This CEMP has been prepared in accordance with the environmental measures identified in the ES (**Chapters 6-17**) and supporting documentation to avoid, reduce or compensate for the adverse effects of the Proposed Development on the environment during construction.

2. Project Team

2.1 Roles and Responsibilities

2.1.1 Establishing roles and responsibilities on site is important to ensure the successful construction of the Proposed Development, including the implementation of the CEMP. This Chapter provides further details on the roles and responsibilities of key members of the Project Team.

2.1.2 To ensure that all the environmental commitments for the construction works are met, it is important to ensure that the roles of staff are clearly set out and that prior to, and throughout the works, they are made aware of the environmental sensitivities and commitments that are required to be adhered to.

The contractor

2.1.3 The contractors will be responsible for implementing the CEMP through contractual agreements with RiverOak.

2.1.4 Prior to each stage of construction commencing, the contractors will prepare or update the management plans listed in this CEMP.

2.1.5 The contractor will prepare and update the site Safety Health and Environment (SHE) Plan, which details relevant safety, health and environmental information relating to all land within the construction site.

2.1.6 The contractor will prepare a list of Contractors Proposals, which will detail all the environmental mitigation measures for each stage of the works that will be implemented. The Contractors Proposals will be in accordance with the CEMP.

2.1.7 The plans will be made available to all persons working on the Proposed Development.

2.1.8 Environmental issues that arise during the construction of the Proposed Development will be reviewed at the inaugural and subsequent regular meetings held by the contractor. Daily toolbox talks will be held by the contractor to inform the construction staff of any environmental issues and any changes to the CEMP, Contractors Proposals and/or the Safety, Health and Environmental (SHE) Plan. The contractor is responsible for any sub-contractors they employ.

Contractor Project Director

2.1.9 It is to be the responsibility of the Contractor Project Director (CPD) to ensure that adequate resources are made available to the Project Team so that the environmental policy is effectively implemented during the construction phase. The CPD will sign the Policy Statement confirming the commitment of the Project Team to ensure that all environmental aspects are managed in accordance with relevant legislative and contractual requirements, and environmental commitments detailed in the CEMP.

Contractor Environmental Manager

2.1.10 The Contractor Environmental Manager (CEM) is responsible for ensuring all environmental standards and commitments are adhered to throughout the construction design, implementation, maintenance and monitoring periods of the Proposed Development.

2.1.11 The CEM will also be responsible for the following:

- Developing and reviewing the CEMP and specialist procedures;
- Leading the appointment and management of environmental specialists at the construction stage;

- Facilitating environmental training and inductions to the workforce, as required;
- Monitoring compliance of construction activities with the CEMP / environmental legislation and licences;
- Acting as the focal point of contact for all environmental issues on site;
- Convening and chairing environmental team meetings and meetings of external consultees; and
- Providing such advice as is required by the Contractor's Project Director on environmental issues.

2.1.12 The CEM will also record and report on all environmental activities on the project. They will monitor and supervise construction activities where appropriate, maintain auditable environmental records and conduct audits as required by the CEMP and offer full time presence on site throughout the construction period.

Environmental Advisor

2.1.13 The Environmental Advisor will be responsible for taking the Proposed Development through the environmental aspects of the statutory process and aid the development of the CEMP in liaison with the specialist advisors. The Environmental Advisor will provide advice and assistance as necessary throughout the construction process.

Environmental Clerk of Works

2.1.14 The Environmental Clerk of Works shall be responsible for recording and reporting all environmental works, the maintenance of related records, attendance at any environmental incidents on site and reporting to the CEM.

Public Liaison Officer

2.1.15 The primary role of the Public Liaison Officer (PLO) is conducting all public liaison associated with the construction phase of the Proposed Development.

2.1.16 The responsibilities and duties of the PLO include the following:

- Responsible for the dissemination of the construction programme to all relevant parties, including any work generating high levels of noise, traffic disruption etc.;
- Acting as first point of contact for members of the public;
- Ensure that all local residents and stakeholders are kept informed of progress and key issues;
- Maintain a register of queries and complaints from the public which will inform the day to day construction activities;
- Responding to queries, responding to complaints and resolving concerns in addition to informing the project manager as and when complaints are received; and
- Production of newsletters / bulletins / social media upon a regular basis to raise awareness of current issues both within the project team and throughout the local community.

Site Health and Safety Advisor

2.1.17 The Site Health and Safety Advisor's main aim is to prevent accident, injuries and work-related illnesses on site. They shall implement health and safety policies in accordance with the latest legislation.

2.1.18 They will be responsible for the following tasks, as well as all responsibilities detailed in the Health and Safety Executive guidance ***Health and safety in construction***:

- Take overall responsibility for compliance with all health and safety requirements at the site and for achieving the required levels of health and safety performance;
- Take responsibility for implementation and management of emergency response procedures, while ensuring health and safety roles are being enacted in accordance with the requirements of this procedures and in line with best industry practice;
- Ensure health and safety roles are provided with suitable environmental awareness training and provision of any specialist environmental training required generally to carry out their roles;
- Ensuring work is undertaken in a safe manner and machinery is used in accordance with manufactures guidance;
- Ensuring that the contractor and their associated employees work in accordance with approved risk assessments;
- Undertake regular (e.g. daily) checks to ensure that the site is tidy and secure;
- Provide health and safety toolbox talks to site employees upon a regular basis (e.g. weekly);
- Reviewing implemented health and safety procedures and where appropriate amending procedures. These reviews will be recorded; and
- Reporting and recording any incidents or near misses.

Ecological Clerk of Works

2.1.19 An Ecological Clerk of Works (ECoW) will be appointed to oversee construction works in ecologically sensitive locations and at site establishment preparatory to construction activities including any site clearance.

Environmental Specialists

2.1.20 A team of experts will be employed and utilised to support the Project Team on specific issues as and when required. They will undertake pre-construction surveys and watching briefs, and oversee implementation, maintenance and monitoring throughout the contract period.

2.2 Environmental Instruction, Awareness Information and Training

2.2.1 All the staff in the contractor's environmental team will be suitably trained for their roles, regarding competency requirements, environmental awareness and maintenance of training records, in order to meet the environmental commitments, set out in the CEMP.

2.2.2 A project specific training plan that identifies the competency requirements for all personnel allocated with environmental responsibilities must be produced and must be contained within the final CEMP. The training plan will aim to cover the following aspects:

- Site induction for all personnel covering the appropriate environmental aspects applicable to the development site;
- Emergency preparedness and response;
- Toolbox talk sessions covering relevant and topical issues associated with the development being undertaken. These will be completed at least monthly for existing site members and additionally completed when new personnel enter the site; and
- Any specific training requirements associated with particular roles. If required, then subsequent training will cover aspects which are required to comply with commitments and general good practice outlined within this report.

2.2.3 Training for all personnel identified in the training plan will be completed before commencement of the associated construction activities. The contractor shall ensure that all personnel engaged in activities that may have an impact on the environment are competent to carry out their duties or, where necessary, arrange for suitable training to be undertaken.

3. Development Construction

3.1 Anticipated Construction Programme

3.1.1 The submission of the Development Consent Order (DCO) application is planned for the first quarter of 2018 following an additional period of statutory consultation under section 42 of the ***Planning Act 2008***[3]. Based on this programme and the anticipated determination period, the DCO may be granted in Q2 2019 and this timescale has been assumed when developing the construction/operational programme.

3.1.2 The construction of the Proposed Development will occur over four separate phases, as detailed in **Table 3.1** below.

3.1.3 The initial phase of construction, following the grant of the DCO, will be the shortest with an expected duration of 12 months. This phase will see a number of different construction activities undertaken in order to ensure that the airport is returned to operational use in Year 2. Phases 2 - 4 of the construction process will be demand led and as such could be shorter or longer in duration than the time periods indicated below. These later phases will take place whilst the airfield is operational and will focus on delivering the increased infrastructure and facilities required to meet the demand of the air freight and passenger forecasts.

Table 3.1 Outline Construction Programme

Component	Start Date	End Date	Works Associated with Phase
Granting of DCO	Q2 2019	n/a	n/a
Construction Phase 1	Q3 2019	Q4 2020	The existing runway will be resurfaced, and a new parallel taxiway will be constructed. Earthworks undertaken. Eight cargo aircraft stands and a 12,000m^2 cargo facility will be constructed. The existing passenger facilities will be reopened and the new fuel farm constructed. The drainage network and associated attenuation ponds will be constructed to ensure surface waters are treated will also be implemented in Phase 1.
Construction Phase 2	Q4 2020	2023	As the airport will be operational by Phase 2, this will constrain construction activities. To minimise disruption to operations, construction will be limited to the provision of additional aircraft stands, cargo warehousing and the extension of the associated lorry and car park facilities and additional earthworks. A new aircraft maintenance hangar will be constructed and the existing hangar demolished.
Construction Phase 3	2023	2030	Further aircraft cargo aprons and warehousing will be constructed plus the associated lorry and car parking. An additional aircraft maintenance hangar will also be provided. Existing buildings adjacent to Spitfire Way will be demolished (cargo buildings and the MT facility). The internal access road will be constructed in its permanent alignment.

Construction Phase 4	2030	2036	The remaining stands and warehousing will be constructed. An additional aircraft passenger stand will be constructed next to the existing passenger apron. A further maintenance hangar will also be provided.

3.2 Working Hours

3.2.1 During Phase 1, the Proposed Development programme assumes a six-day working week, with construction confined to the hours of 07:30 to 17:30 Monday to Friday and Saturday 07:30 to 13.00. There is no planned working on Sundays or Bank Holidays.

3.2.2 The above hours may be subject to seasonal variations and dictated by the construction activity being undertaken and prevailing weather conditions. For example, the typical working day in the summer months could be 07.00 to 19.00, while during the winter months this may shift to 08.00 to 16.00.

3.2.3 During Construction Phases 2 - 4, when the airport would also be operational, construction may need to take place outside of the above hours, including during the evening and at night. These additional time periods have been taken into account in the assessment of noise impacts with appropriate mitigation measures proposed where necessary.

3.2.4 The above hours are also outside of those commonly applied throughout the UK. Consequently, hours will need to be agreed with the local authority. Working hours can be formally agreed via:

- The submission of an application for consent under section 61 of the ***Control of Pollution Act 1974***; or
- The local authority can serve a notice specifying such works under section 60 under the ***Control of Pollution Act 1974***. Works outside the above hours can be agreed through the submission of a variation and dispensation detailing associated justifications.

3.3 Construction Site Compound Preparation

3.3.1 Compound areas will comprise offices, welfare facilities, vehicle parking and material storage areas, which will be located within the airport boundary. During Construction Phase 1, a construction compound, storage and working area would be established on an area of existing concrete hardstanding, near to the new access on B2190 (Spitfire Way). The area will be kept clean and tidy and equipped with spill clean-up kits. The existing airport hangars and buildings located in this area would be utilised for storage and office space to reduce the need for any temporary site cabins or facilities.

3.3.2 For subsequent construction phases (Phases 2 - 4), which will require a much smaller compound area, a site compound is proposed in the south east of the site.

3.4 Reinstatement of Land on Completion

3.4.1 Any land temporarily acquired to be used for the construction of the Proposed Development will be reinstated in accordance with requirements of the DCO.

3.5 Traffic Management during Construction

3.5.1 Construction traffic management is outlined in the Traffic Management Plan (**Volume 15 of the Environmental Statement (ES)**).

3.5.2 A summary of the key routing measures that will be implemented are detailed below.

Construction accesses

3.5.3 Construction accesses will be the same locations as the permanent junctions to serve the Proposed Development. Construction vehicles will leave and enter the wider road network via five proposed access points:

- Northern Grass Area West Access – Redesigned standard priority junction with ghost right turn facility with Manston Road;
- Northern Grass Area South Access – New signalised junction with Manston Road;
- Cargo Access – New Roundabout junction with Spitfire Way;
- Airport Terminal Access – Redesigned access now as a signalised junction with Manston Road; and
- Fuel Farm Access – No change to the layout of the existing access as already capable of accommodating the Construction and Operational trips required.

HGV routing

3.5.4 The proposed route is from the A299 to the main construction sites. Construction traffic HGVs would leave the A299 at the Minster Roundabout and travel North on Minster Road. At the next roundabout traffic would turn right onto B2190 and follow it a short distance to a roundabout junction with Columbus Avenue. Construction HGVs would route ahead at this junction and follow the B2190 Spitfire Way and either access the site via the Cargo access or continue to the next junction with Manston Road and follow appropriate routes to the other three accesses in this location.

LGV / Cars construction trips

3.5.5 It is acknowledged that controlling these vehicles is more difficult, however, within the mitigation schemes set out below driver packs will be provided to all staff and this will include information regarding roads to avoid. A list of roads has been identified as being restricted to light goods vehicles which is detailed within the Traffic Management Plan (**Volume 15 of the Environmental Statement**).

Mitigation

3.5.6 As part of the Traffic Management Plan, a number of mitigation measures have been proposed to manage the following:

- Access;
- Working hours;
- Preferred construction routes for all vehicle trips;
- Timing of deliveries;
- Temporary traffic signage;
- Vehicle identification;
- HGV emissions;
- The requirement for banksman at accesses;
- Vehicle/wheel washing;
- Temporary traffic management procedures;
- Information packs and communications;

- Sustainable staff travel;
- Highway condition survey; and
- Public Rights of Way.

3.5.7 By implementing the proposed mitigation measures, this will reduce any potential impact of the movement of construction traffic in the highway network. Further information on these measures can be located within Section 6 of the Traffic Management Plan.

4. General Procedures

4.1 Inspections

4.1.1 Inspections of the site shall occur to ensure compliance with the CEMP and to minimise the risk of damage to the environment. All environmental incidents shall be reported to the CEM.

4.1.2 The contractor will undertake daily inspections, which will include monitoring conformance with the CEMP. Daily assessment forms of environmental performance will be completed during the daily checks; these will be measured against environmental standards, relevant legislation and the CEMP objectives.

4.1.3 Checks on equipment will be undertaken to reduce the risk of incidents occurring (for example oil leaks). As a minimum, the following equipment will be inspected:

- Fencing;
- Waste storage facilities;
- Soil management;
- Oil separators;
- Chemical storage facilities;
- Bund integrity;
- Foul water storage facilities;
- Silt traps;
- Drainage ditches and watercourses;
- Storage vessels (including pumps, gauges, pipework and hoses);
- Secondary containment (for example, secondary skins for oil tanks);
- Spill response materials; and
- Equipment with potential to leak oils and other liquids, for example, compressors and transformers.

4.1.4 Sensible monitoring inspections will be undertaken by the contractor and their appointed Health, Safety Security and Environment (HSSE) auditors to ensure the daily checks are being undertaken correctly.

4.1.5 The inspections will also include:

- Reviewing the daily risk assessment forms;
- Ensuring that faults and defects are identified and rectified; and
- Providing data for performance monitoring.

4.1.6 Environmental performance data will be collected and collated into the SHE Plan. The plan will present a set of rules for manufacturing health, safety, and environmental activities.

4.1.7 The CEM shall produce a monthly report detailing environmental performance and non-compliances. Document control shall be in accordance with a Quality Management Strategy to be developed by the appointed contractor. Copies of all environmental audit reports, consents and licences shall be maintained by the contractor.

4.1.8 The contractor shall be responsible for assigning responsibility, investigating and addressing any non-conformances raised by any inspection with an agreed time frame and ensuring that corrective and preventative actions have been fully closed out.

4.1.9 RiverOak's and the contractors' monitoring reports will be made available to statutory and non-statutory bodies on request. Where specific environmental management and reporting is required it will be set out in the relevant management plans.

4.2 Communication

On-site communication

4.2.1 In order to ensure that environmental issues are communicated on site the following environmental training and on-going communication methods will be carried out. The list in **Table 4.1** is not exhaustive.

Table 4.1 Environmental Training and Communication

Training / Briefing	Frequency	Attendees
Induction Training	On first visit to site	All individuals attending site
Risk Assessment Briefing	Every job task	Those involved in the task
Environmental Toolbox Talks	Once per month	All individuals undertaking work on site
Environmental Briefings	As required	All individuals undertaking work on site
Job Specification Training (e.g. IOSH Working with Environmental Responsibilities, Site Waste Management etc.)	As required	All individuals with environmental responsibilities
Project specific information (inclusive of this CEMP)	As required	All individuals on site briefed and information displayed on site notice boards

4.2.2 The CEM shall advise the contractor's Project Manager on external communication with regulatory bodies, the public and any other external stakeholders on environmental matters.

4.2.3 The Contractor must communicate to the employers and any sub-contractors employed on the site the following:

- Details and arrangements of any audits or inspections undertaken;
- Details, inclusive of relevant statistics, of environmental incidents and near misses;
- Details of any pending and current enforcement action in respect of any environmental incidents which have occurred;
- Monthly and cumulative statistics; and
- Any other additional environmental issues which have been identified.

External communication

4.2.4 External communication on site typically includes:

- Communication with interested third parties;
- Addressing complaints from members of the public; and
- Communication with the media.

4.2.5 As outlined in **section 2.1**, the contractor will appoint a PLO to carry out liaison duties with the public and others and will develop the Communications Plan for the Proposed Development. The responsibilities of the PLO are outlined in **section 2.1**.

4.2.6 Contact details of the PLO will be made publicly available and advertised clearly.

4.2.7 Contact details will be detailed in the provided and detailed displayed on the site notice board. A template for the Contact List is provided in **Appendix B**.

4.3 Incident Procedure

Pollution Incident Control Plan (PICP)

4.3.1 The Contractor will develop and implement a PICP which will detail their response in the event of any pollution incident on site.

4.3.2 The following measures and information will be included and detailed further in the PICP to manage any pollution incidents and limit adverse effects on the receiving environment:

- Description of the procedure to be followed in the event of a pollution incident (in accordance with the 'Incident Response' procedure below);
- Description of the procedure for the notification of appropriate emergency services, authorities and personnel on the construction site;
- Description of the procedure for the notification of relevant statutory bodies, environmental regulatory bodies, local authorities and local water and sewer providers;
- Maps showing the locations of local emergency services facilities such as police stations, fire authorities, medical facilities, other relevant authorities, such as the Environment Agency (EA) together with the address and contact details for each service and authority;
- Contact details for the persons responsible on the construction site for pollution incident response; and
- Contact details of a competent spill response company which can be contacted at short notice for an immediate response.

4.3.3 As part of the PICP, access to the following will be ensured:

- Site Drainage Strategies and Emergency Flood Response Plans are available on site and are kept up-to date; and
- Staff competence and awareness in implementing plans and using pollution response kits.

Incident response

4.3.4 All incidents associated with the construction of the Proposed Development, including environmental incidents and non-conformance with the CEMP, will be reported and investigated.

4.3.5 The following procedure will be followed in the event of an incident and will be detailed further in the PICP:

- Works will cease;
- The Contractor Project Director (CPD) and CEM will be contacted, the Land Officer will be contacted if on private land, for grantor liaison;
- The size of the incident will be assessed;
  - If the incident is controllable by staff on site, remedial action will be taken immediately in accordance with the PICP;
  - If the incident cannot be controlled by the staff on site, emergency assistance will be sought;
- The appropriate enforcing authority will be contacted and informed, including:
  - The Environment Agency (EA) for incidents potentially affecting rivers, groundwater and major emissions to atmosphere;
  - The local sewerage undertaker for incidents affecting sewers;
  - The Local Authority Environmental Health Department for incidents that could affect the public; and
  - The Food Standards Agency for incidents that have the potential to affect food through deposition on crops or land used for grazing livestock.
- The CPD and CEM will instigate an investigation into the occurrence of the incident;
- The findings will be sent to the appropriate enforcing authority where necessary; and
- An action plan will be prepared to determine why the incident occurred and whether any modifications to working practices are required to prevent a recurrence. If necessary, the CEMP and SHE Plan will be updated (and any other plans as appropriate) and all workers will be notified.

4.3.6 Lessons learnt shall be fed back to site staff through safety and environment briefings and used by the CEM to amend procedures and update the CEMP accordingly.

Incident response training

4.3.7 Emergency procedures shall be tested monthly by the CEM. Examples of procedures will include:

- The names and 24-hour contact details of all emergency response personnel and emergency services;
- The procedures for reporting and documenting an emergency incident;
- Personnel responsibilities during an emergency incident; and
- The location of on-site information on hazardous materials and spill containment materials.

4.4 Health and Safety

4.4.1 RiverOak is committed to ensuring the health and safety of persons working on projects and the protection of the environment is maintained in accordance with the Construction (Design and Management) Regulations 2015 (CDM)[4] and the principles and philosophy behind them.

4.4.2 In accordance with health and safety legislation[i], the contractor will prepare a Construction Phase SHE Plan prior to construction works commencing.

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[i] ***The Management of Health and Safety at Work Act 1999***

4.4.3 The SHE Plan will be prepared for each element of the Proposed Development, including construction work. The Plan will ensure that adequate arrangements and welfare facilities are in place to cover:

- The safety of construction staff;
- The safety of all other people working at or visiting the construction site;
- Overall compliance with health and safety legislation, approved codes of practice and industry best practice;
- Emergency procedures being defined and adopted; and
- Appropriate training and information being provided to personnel.

4.4.4 The contractors' Construction Phase SHE Plan will be reviewed by RiverOak to ensure it meets CDM 2015 prior to construction commencing. The SHE Plan will be managed, implemented and updated as necessary through the duration of the Proposed Development by the CPD.

4.4.5 All staff, site visitors and delivery drivers will receive a relevant project induction by the contractors to ensure they are aware of site hazards and health, safety and environmental management requirements. Site staff will be briefed daily by the contractors prior to work commencing. Site-specific risk assessments will be carried out to ensure the risk remains relevant. The contractors will be required to carry out audits and inspections throughout the Proposed Development in accordance with **Section 4.1** of this CEMP.

Risk assessments

4.4.6 All activities undertaken on site shall be subject to a risk assessment. Risk assessments will be undertaken by trained staff following an approved procedure which will:

- Identify the significant environmental and Health and Safety impacts that can be anticipated;
- Assess the risks from these impacts;
- Identify the control measures to be taken and re-calculate the risk;
- Report where an inappropriate level of residual risk is identified so that action can be taken through design changes, re-scheduling of work or alternative methods of working to reduce the risk to an acceptable level;
- The results of risk assessments and their residual risks are only considered acceptable if: the severity of the outcome is reduced to the lowest practical level; the number of risk exposures are minimised; all reasonably practical mitigating measures have been taken and the residual risk rating is reduced to a minimum; and
- The findings of the risk assessment and the necessary controls will be explained to all operatives before the commencement of the relevant tasks using an instruction format agreed with the CEM.

4.5 Waste Management

4.5.1 Waste material will be generated at all stages of the construction process. Construction waste will arise from the following key aspects of the Proposed Development:

- Demolition of existing buildings and infrastructure (including the ATC Tower; air freight facility, fire station, maintenance hangar and passenger terminal);
- Removal of the existing fuel farm;
- Excavation and earthworks for preparation of foundations; and

- Construction of new buildings (ATC Tower; expanded cargo facilities, larger fire station, additional maintenance hangars and a new passenger terminal); runway refurbishment; asphalt pavement (access, storage and parking); concrete pavement (taxiway and aprons); and airport related business development (in the 'Northern Grass' area).

4.5.2 Indicative targets for the construction of the Proposed Development are to achieve an 87% diversion of waste from landfill and 62% re-use of materials within the site.

4.5.3 The bulk of the imported material will be hardstone for asphalt and Pavement Quality Concrete, in addition to sands and gravels for use in the lower layers in the aircraft pavements and drainage. Approximate quantities of the main materials required for the construction of the Proposed Development during Construction Phase 1 are given in **Table 4.2** below.

Table 4.2 Construction Materials

Material	Quantity
Aggregates for pavement construction	400,000 tonnes
Fill for earthworks	300,000m^3
Ready mixed concrete	10,000m^3
Asphalt	75,000 tonnes
Building construction	12,000 tonnes
Miscellaneous	10,000 tonnes

4.5.4 RiverOak and the contractors are responsible for managing waste arising from all activities to prevent pollution and to meet or exceed legal requirements[5].

4.5.5 RiverOak will prepare an Outline Waste Management Plan (OWMP). The contractors will prepare and submit a Site Waste Management Plan (SWMP) to RiverOak to include their associated works. It is advised that further engagement is undertaken with Kent County Council, as the waste disposal authority when preparing these documents.

4.5.6 It is anticipated that the following will be considered for the construction phase.

Construction phase waste

4.5.1 Earthworks construction waste could be minimised by balancing the cut and fill operations for the new aircraft cargo stands and warehousing plus utilising any low areas on the grassed area including the 'Northern Grass' area. At this stage, there is insufficient information to determine the existing earthwork materials' suitability as an engineering fill material underneath the aircraft pavements.

4.5.2 A complete geotechnical site investigation, leading to a detailed earthworks strategy, will precede any permanent earthworks operation.

4.5.3 Demolition arisings, where possible, will be recycled for use on site. This includes the material from the existing taxiways and apron stands that will be removed.

4.5.4 Wrapping and packing will be returned to the supplier.

4.5.5 It is recommended that good practice segregation of waste is followed during the construction phase of the development. Sufficient space should be allowed to allow segregation of demolition, construction and excavation wastes. However, the location will be dependent on constraints in the working area of the site. It is expected that the following principles would apply:

- Recyclables – Waste storage receptacles/areas should be clearly marked to promote source segregation and inhibit contamination. A waste stream colour coding system could be employed to aid the successful segregation of waste at source. This can take the form of different coloured signs or bins or skips indicating which waste stream can be accepted in each receptacle/area. The Institution of Civil Engineers (ICE) developed a generic colour coding scheme for the construction industry; it is suggested that this system could be used during construction of the development. Containers should be fit for purpose and of a suitable durable construction for use. Prior to leaving the site containers/vehicles shall be sheeted and secured to prevent emission of particulates and dust.
- Food waste – If a site construction compound will include a canteen where food is produced, prepared or sold then food waste may also be segregated. Bins would need to be provided for the recyclables mentioned above, plus food if sufficient quantities are produced.
- Residual waste – If residual waste is to be landfilled then testing should be carried out to ensure that demolition or excavation materials are given the correct Waste Acceptance Criteria (WAC) classification, and are disposed of correctly as inert non-hazardous waste. A full record must be maintained of all materials that are removed from the site.
- Hazardous waste – Any hazardous waste generated as part of demolition, excavation or construction activities needs to be segregated from other waste streams to prevent cross-contamination, and suitable containment is required to provide storage and onward transport, according to the type of hazard (e.g. bunded storage for liquids). Hazardous waste should be disposed of correctly using suitable registered waste carriers and facilities for hazardous waste. A full record must be maintained of all hazardous waste materials that are removed from the site.

4.6 Security

4.6.1 The construction site will be controlled in accordance with the statutory duty to prevent unauthorised access to the site. Site-specific assessments of the security and trespass risk will be undertaken at the site and appropriate control measures implemented. The control measures are likely to include:

- Consultation with Kent Police on security proposals for the site with regular liaison to review security effectiveness and response to incidents; and
- Immobilisation of plant out of hours, removing or securing hazardous materials from site, securing fuel storage containers and preventing unauthorised use of scaffolding.

4.7 Welfare

4.7.1 No living accommodation will be permitted on the construction site. Onsite welfare facilities will be provided for all site workers and visitors. Welfare facilities will be kept clean and tidy.

4.8 Pest Control

4.8.1 The risk of infestation by pests or vermin will be reduced by implementing appropriate storage and regular collection of putrescible waste. If infestation is found, removal and prevention measures will be implemented promptly in consultation with the Ecological Clerk of Works (ECoW) to ensure that no protected species is harmed as a result. Any pest infestation of the construction site will be notified to the Local Authority as soon as is practicable.

4.9 Invasive Species Management

4.9.1 There is a need to ensure that the Proposed Development does not result in contravention of the legislation relating to invasive species management.

4.9.2 The spread of these invasive species would be prevented by the implementation of best practice measures following EA guidelines, thus avoiding contravention of the legislation.

4.10 Unexploded Ordnance

4.10.1 Risk assessments will be undertaken prior to each stage of construction commencing for the possibility of unexploded ordnance being found within construction areas. These will be used to specify safe working requirements, which may include advance magnetometer surveys at piling locations and appropriate training for site operatives. An unexploded ordnance specialist will be available on-call for any works in high risk areas.

4.10.2 An Emergency Response Plan for unexploded ordnance will be prepared by the contractors and will be followed to respond to the discovery of unexploded ordnance. This will include notifications to the relevant local authorities, emergency services, residents and businesses.

4.11 Utility Works

4.11.1 Appropriate plans and schedules will be provided by RiverOak to the contractors identifying all known utility infrastructure and any proposed diversions. Where changes to utility infrastructure cannot reasonably be avoided, the contractors will agree arrangements with RiverOak and the owner of the utility equipment for it to be relocated.

4.12 Consents and Licenses

4.12.1 The ES contains details of the consents and licences RiverOak currently believes will be required to construct the Proposed Development that will be obtained outside of the DCO process.

4.12.2 A Consents Register will be maintained by the CEM which will document all existing consent conditions, record all new applications made and the status of the applications.

4.13 Legal and Other Requirements

4.13.1 A Register of Legal and Other Requirements will be maintained in the CEMP. This will include information relevant to the Proposed Development.

4.13.2 A draft Register of Legal and Other Requirements can be located in **Appendix C**.

5. Environmental Management and Construction Principles

5.1 Objective

5.1.1 This Chapter of the CEMP provides an overview of the environmental measures that will be implemented during the construction of the Proposed Development to avoid, reduce or compensate for adverse effects as identified in the ES.

5.2 Air Quality

Objective

5.2.1 To undertake the construction of the Proposed Development whilst minimising emissions of dust and other pollutants to avoid effects on air quality.

Potential effect and environmental measures

5.2.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.1**.

Table 5.1 Air Quality Measures to be incorporated during the Construction Phase

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Construction Phase		
Local road network	Dust soiling of the local road network as a result of trackout of dust and mud from vehicles entering and leaving the site during the construction phase.	The contractor will produce and implement a Dust Management Plan (DMP); this will include details of measures to identify and reduce the risk, monitoring any dust and identify appropriate clean-up measures. Monitoring will be agreed with the Local Authority in accordance with best practice for construction projects. This will include use of dust gauges at suitable residential receptors. Osiris monitoring of Particulate Matter (PM) may be used during more intense periods of construction activity (e.g. the initial construction period in the run-up to opening). Measures will include, but are not limited to the following: • The use of wheel wash facilities; • Covering of all loads entering/leaving the site, • Use of water-assisted dust sweeper(s); • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; • Record all inspections of haul routes and any subsequent action in a site log book; and • Where practicable, hard surfaced haul routes (e.g. trackways) will be installed, which are regularly cleaned.
Human health and	Potential effect on human health and ecological receptors from dust during the construction phase.	The contractor will produce and implement a DMP, this will include details of measures to identify and reduce

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
ecological receptors		the risk, monitoring any dust and identify appropriate clean-up measures. Measures will include, but are not limited to the following: • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; • Locate stockpiles away from site boundary/receptors; • Cover or dampen down stockpiles; • Implement stockpile maintenance / management; • Removal of dusty materials from site as soon as practicably possible; • Where practicable, only remove the cover in small areas during work and not all at once; • Stockpile surface areas will be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up; • Where practicable, windbreak netting/screening will be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings; and • Ensure site machinery is well maintained and in full working order.
Human health and ecological receptors	Potential effect on human health and ecological receptors from air quality effects from Non-Road Mobile Machinery, and vehicles during the construction phase.	The contractor will implement measures to reduce or limit air quality effects during the construction phase of the Proposed Development. This includes, but is not limited to the following: • Avoiding the use of diesel or petrol-powered generators and use mains electricity or battery-powered equipment where practicable; • Ensuring all vehicles switch off engines when stationary - no idling vehicles; • Loads entering and leaving the site with dust generating potential must be covered and wheel washing facilities made available; • Vehicles to comply with site speed limits; • Water assisted sweeping of local roads to be undertaken if material is tracked out of site; • A construction logistics plan will be produced to manage the sustainable delivery of goods and materials; and • Where practicable, hard surfaced haul routes (e.g. trackways) will be installed, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

5.3 Biodiversity

Objective

5.3.1 To avoid, reduce or compensate for potential adverse biodiversity effects.

Potential effect and environmental measures

5.3.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.2**.

Table 5.2 Ecological Measures to be incorporated during the Construction Phase

Potential Receptor	Predicted Changes and Potential Effects	Incorporated Measures
Designated sites	Pollution/eutrophication from Site discharges	Discharge of treated water to Pegwell Bay rather than to ground with appropriate monitoring of water quality to ensure quality standard is maintained. The discharge will be regulated under a Water Discharge Activity Permit from the EA.
Habitats	Habitat loss	Compensation through off-Site habitat creation at the c. 36ha land parcel 1362. Habitats will be managed specifically for the biodiversity value to be higher quality than that occurring on-Site.
Potential effects on birds due to damage or destruction of active nests	Legal non-compliance	Any removal of vegetation or buildings with the potential to support nesting birds will, wherever possible, be undertaken outside the bird nesting season (March to August inclusive) to ensure compliance with the ***Wildlife and Countryside Act (WCA) 1981 (as amended)***[6]. If any clearance work has to be undertaken during the main breeding season, it will only be undertaken after a qualified ecologist has confirmed that the feature does not support any nesting birds. In view of this, no potential adverse effects are anticipated.
Bats	Disturbance to/loss of foraging, commuting habitat for bats Potential disturbance to roosts, mortality/injury to individuals; habitat loss	A method statement and tool-box talk will be prepared that would include details of pre-construction verification surveys for bats, describing the approach that would be followed to avoid contravening the ***WCA 1981*** (as amended)[7] and ***The Conservation of Habitats and Species Regulations 2010***[8]. Where required, this would involve obtaining an EPS mitigation licence through Natural England (NE) with respect to development. The method statement will also describe habitat enhancements to be implemented as part of the Proposed Development. Due to the nature of the development much of the Site will be unsuitable for bats once operational with extensive Site and building lighting. Consequently, compensation for foraging/habitat/roost loss and any enhancements (including the installation of bat barns/boxes) are provided off-Site within land parcel 1362.
Breeding birds	Disturbance to/loss of foraging habitat/breeding sites/shelter	Off-Site habitat provision in the c.36ha land parcel 1362[ii] for ground nesting farmland birds e.g. skylark and grey partridge. Although the extent of off-Site habitat provision is lower than what is being lost, the habitat provided will be of higher quality. Created habitats, improving the quality of that lost on Site, will have particular species-specific habitat creation measures and management for farmland birds.

[ii] See Appendix 7.10 of the ES for an extended Phase 1 habitat survey report of land parcel 1362.

Potential Receptor	Predicted Changes and Potential Effects	Incorporated Measures
Reptiles	Kill/injure reptiles	Method statement and tool box talks will be prepared to avoid contravening the ***WCA 1981 (as amended)***[9]. Removal of suitable habitat would be designed to avoid the risk of injury to reptiles, through measures such as timing ground works to avoid the reptile hibernation period and the gradual removal of habitat. Any reptile populations in the remaining unsurveyed areas (c.4ha) will be captured and translocated to suitable habitats (e.g. with hibernacula, compost heaps, log/brash piles and basking areas) on Site (south of the existing southern perimeter fence) and off-Site (land parcel 1362).
Terrestrial invertebrates	Disturbance to/loss of foraging habitat/breeding sites	Compensation through habitat treatments on Site (e.g. maintenance of a stressed vegetation community along runway edges by permitting short vegetation to grow on shallow substrate upon runway surface), and habitat creation on-Site south of the current southern perimeter fence and within land parcel 1362. Created habitat will be specifically designed with diverse features to encourage invertebrates (e.g. including features typical of open mosaic habitat.
Barn owl	Disturbance to nesting birds	Wherever possible, construction within 200m of barn owl nest sites will be timed to avoid breeding season (that is March – December inclusive). If this is not possible, nest boxes would be capped outside the breeding season prior to construction and new alternative nest sites will be installed off-Site at sufficient distance to prevent birds using the operational Site.
All	Damage to species through disturbance from noise	Noise control measures are outlined below. During the construction phase these will include maintaining buffer distances to sensitive receptors, use of best technology, dampers on vibrating or noise emitting equipment, timing of works. Operational phase measures are set out in the noise mitigation plan (refer to Appendix 2.2 of the ES).
All	Damage to habitats and/or species through smothering/inhalation from dust	The contractor will produce and implement a DMP this will include details of measures to identify and reduce the risk, monitoring any dust and identify appropriate clean-up measures. Measures will include locating stockpiles away from site boundary/receptors, covering or damping down stockpiles, stockpile maintenance/management, and removal of materials from site.
All	Damage to habitats and/or species caused by changes to air quality arising from Non-Road Mobile Machinery and vehicles during the construction phase	The contractor will include measures to reduce or limit air quality effects during the construction phase of the Proposed Development. Measures will include avoiding the use of diesel or petrol-powered generators and use mains electricity or battery-powered equipment where practicable; ensuring all vehicles switch off engines when stationary - no idling vehicles.

Potential Receptor	Predicted Changes and Potential Effects	Incorporated Measures
All	Damage to habitats and/or species through pollution (terrestrial and aquatic) during construction.	Construction practices will comply with the EA's Pollution Prevention Guidelines with a view to preventing the pollution of ground and surface water. Pollution prevention control measures for water quality issues (including the management of noise and dust) are detailed in further sections of this CEMP and will be implemented during the construction phase to avoid damage to habitats/species.
All	Damage to habitats and / or species as a result of emissions from aircraft movements on the ground and during the Landing and Take Off cycle.	Planning of aircraft arrival and departure scheduling to avoid, where possible, over-long idling, taxiing and hold times. Airfield layout design to minimise times taxiing and holding. Use of FEGP to minimise engine/Auxiliary Power Unit use. Bans on older, dirtier aircraft.

5.4 Freshwater Environment

Objective

5.4.1 To comply with relevant statutory provisions including any consents required in respect of the water environment; to protect both the aquatic environment and to avoid unacceptable adverse effects including changes to flow volume, water levels, water quality and watercourse morphology due to construction.

Potential effect and environmental measures

5.4.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.3**.

Table 5.3 Freshwater Measures to be incorporated during the Construction Phase

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Surface and groundwater	Uncontrolled sediment from the construction process entering the freshwater environment as a potential pollutant.	Site access points will be regularly cleaned to prevent build-up of dust and mud. Earth movement will be controlled to reduce the risk of silt combining with the site run-off. Properly contained wheel wash facilities will be used (where required) to isolate sediment rich run-off. Cut-off ditches and/or geotextile silt-fences will be installed around excavations, exposed ground and stockpiles to prevent the uncontrolled release of sediments from the site. Sediment traps will be required on all surface water drains in the surrounding region. Silty water abstracted during excavations will be discharged to settlement tanks or siltbusters as appropriate. Cleaned run-off will be discharged through the existing foul sewer drains. If sewer capacity is limited

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		then silty water will be stored and removed from the site by tanker and disposed of at a suitably licensed location. A discharge consent for discharge to foul sewer, detailing volumes and rates of discharge will be agreed with Southern Water (SW) prior to the commencement of works, if necessary. Outfalls into surface waters will be monitored regularly during construction and works halted if pollution is observed. Particular attention will be paid to the outfall leading to Pegwell Bay, where specific measures will need to be designed by the contractor covering all phases of construction and agreed with Natural England, the Environment Agency and all other relevant authorities, prior to the commencement of construction works. The EA will also be consulted to ensure that the water quality discharge licence is varied in accordance with the current design proposals. Stockpiles and material handling areas will be kept as clean as practicable to avoid nuisance from dust. Dusty materials will be dampened down using water sprays in dry weather or covered. Outfalls into surface waters will be monitored regularly during construction and works halted if pollution is observed. 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. Outfalls into surface waters will be monitored regularly during construction and works halted if pollution is observed. • Location of monitoring: any points of surface water discharge from the site. It is assumed within the ES that in Phase 1 all construction water will go to bowser to be taken off site for discharge, and therefore no monitoring will be required. In construction phases 2-4, the ponds will be in use and the discharge from the ponds will be monitored. • Frequency of monitoring: The water quality should be inspected at least on a daily basis at point of outfall for low risk operations, but also in an ad-hoc way to coincide with changes in

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		construction activities, which could change the outflow water quality profile. There could be a requirement for continuous monitoring (e.g. turbidity, EC) if a particular contaminant were identified in the made ground on site. It should be noted that runoff is largely going to occur from areas of hardstanding due to the high infiltration capacity of the soils / aquifer, therefore works in areas where soils are exposed are not likely to generate runoff. In addition, conditions are relatively dry at Manston and therefore the number of days that runoff is generated will be small, and the number of days that the pump is in operation will also be small. As a result, an event-based monitoring regime may be more appropriate than a continuous regime. The frequency of monitoring should be determined once the detailed construction phasing and dewatering plans have been finalised, as well as the GI works.
Surface and groundwater	Spillages of oils and other chemicals associated with the construction process entering the freshwater environment as a potential pollutant.	Wherever possible, plant and machinery will have drip trays beneath oil tanks / engines / gearboxes / hydraulics which will be checked and emptied regularly and correctly disposed of via a licensed waste disposal operator. Oils and hydrocarbons will be stored in designated locations with specific measures to prevent leakage and release of their contents, including the siting of the storage area away from the drainage system on an impermeable base, with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked when not in use. A PICP will be produced to include response to spillages of oil, which site staff will have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of spill kits, booms, bunding and absorbent material. Personnel will be trained on the use of spill kits, where applicable. The bulk of the existing runways and taxiways will be kept as they afford protection to the adit in Source Protection Zone (SPZ) 1. In order to mitigate against any potential foreign object damage hazard (a concern raised by the Civil Aviation Authority (CAA)), it is proposed to overlay the extended paved area with asphalt as part of the initial construction phase. As this work is within close proximity of the Western Adit the method of working it will be subject to a further detailed assessment to minimise the risk of contamination along the runway edges.

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		Hazardous liquids will be stored further than 10m from any surface waters or surface water gullies. All other physical work within close proximity of the Western Adit will be potentially restricted (in type, timing and duration), subject to a further assessment.
Surface and groundwater	Pollution incidents resulting from concrete batching and cement products on-site during the construction process.	Any mixing and handling of wet concrete that is required on-site will be undertaken in designated areas outside of SPZ1, and the location and configuration of the plant will be agreed with the EA. A designated area will be used for any washing down or equipment cleaning associated with concrete or cementing processes and facilities provided to remove sediment prior to disposal to foul sewer. Any contaminated soil will be identified by ground investigation prior to construction and either treated on-site and reused, or removed and disposed of off-site by a suitably licensed waste disposal operator. Measures such as cut-off trenches will be put in place to prevent any potentially polluted run-off from within the site entering any excavations.
Groundwater	Intrusive works and boreholes increasing the risk of creating pollution pathways to the underlying aquifer	The requirement for site investigation boreholes increases the risk of creating pollution pathways to the underlying aquifer. All shallow (less than 10m) excavations, trial pits and geotechnical boreholes once completed will be adequately backfilled and sealed. Deeper boreholes will be avoided but if required will be subject to further assessment. No boreholes will be permitted within 100m of the centre line of the Western Adit without a full risk assessment.
Groundwater	Piling increasing turbidity of groundwater at the Lord of the Manor source.	The approach to any on-site piling will be agreed with SW and the EA prior to the commencement of works. Piling in sensitive areas will be avoided. Piling methods will be designed to have a minimum of ground disturbance and will be in accordance with ***Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on pollution prevention***[10] and ***Piling into contaminated sites***[11].
Water supply / sewage infrastructure	Effects on the functionality of the water supply and sewer infrastructure around the site during the construction phase.	The exact locations of nearby sewers and water supply infrastructure needs to be established by on-site survey prior to demolition works. An appropriate protection system (i.e. temporary support structure, sheet piles, installation of secant piles etc.) must be implemented to minimise any impact to the public sewer network. The piling methodology will be developed considering the

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		neighbouring utility services. Piling will be avoided in sensitive areas. The water demand for the construction phase will be agreed with SW. Discharge rates from the site will not exceed current sewer capacity, and these rates will be agreed with SW to ensure appropriate storage is provided on site during the construction phase. The EA will be consulted on any changes made to the design of the surface water system.

5.4.3 During the re-development of the fuel farm site strict measures will be implemented to ensure that:

- The existing infrastructure is removed safely to avoid any spillage from any residual fuel on site;
- Any site investigation will follow the restrictions set out in Table 5.3 above; and
- Any residual ground contamination will be dealt with as set out in Table 5.5 below (Land Quality).

5.5 Historic Environment

Objective

5.5.1 To avoid, reduce or compensate for potential adverse effects on historic environment features during the construction phase of the Proposed Development.

Potential effect

5.5.2 The works have the potential to affect the historic environment as a result of:

- Potential direct effects on undesignated and previously unrecorded heritage assets within the Proposed Development site boundary. These effects would arise from the construction phase of the Proposed Development and could include the disturbance or removal of archaeological remains by intrusive groundworks or piling;
- Potential direct and indirect effects on the heritage significance of the airport and surviving assets relating to World War One (WWI), interwar, World War Two (WWII) and Cold War uses of the site. These effects could arise from losses or changes to existing heritage assets as a result of the construction of the Proposed Development;
- Potential indirect effects on the setting and views of designated and undesignated heritage during the construction phase of the Proposed Development. These effects may arise from the effects of construction activities and equipment such as cranes and the concrete/asphalt batching plants; and
- The Proposed Development will safeguard the museums. Kent County Council (KCC) has expressed that the two museums, or new heritage area, retain a view to the airport runway.

Environmental measures

Environmental measures incorporated into the construction phase

5.5.3 A summary of the environmental measures that have been incorporated into the Proposed Development in order to avoid, reduce or compensate for potential adverse effects on historic environment features during the construction phases is provided in **Table 5.4**.

Table 5.4 Historic Environment measures incorporated into the construction phase

Potential receptor	Predicted changes and potential effects	Incorporated measure
Non-designated heritage assets of archaeological interest	Disturbance or removal of assets could give rise to loss of archaeological interest. Potential harm to non-designated assets has been assessed in the desk based assessment (**Appendix 9.1**). The assessment identified potential for assets of national, regional and local significance.	Harm or loss of archaeological interest will be avoided or minimised to a degree through flexibility inherent in the masterplanning process following any further investigation and survey that may be required. Disturbance in the areas to the south of and to either end of the runway will be limited to services and lighting.
	Based on topography, the area along and to the south of the ridgeline, along which the runway is located, is identified as being archaeologically sensitive.	The existing runway, taxiways and areas of hardstanding will be used to minimise further disturbance and intrusive works in the demonstrably sensitive areas, to either end and to the south of the runway, which will be restricted to provision of services.
Historic Landscape Character, designated assets and current heritage uses within the airport boundary	Changes to the layout of the airport arising from the visibility of construction works, demolition and construction work access. Changes to non-designated structures and location of heritage assets within the airport (see **Appendix 9.1** for details of assets and **Chapter 3: Description of the Proposed Development** for changes).	Removing temporary construction features to restore plan and character of airport where possible. Reuse and/or relocation of historic structures where feasible (see **Chapter 3: Description of the Proposed Development**).

5.6 Land Quality

Objective

5.6.1 To avoid, reduce or compensate for potential adverse effects on land quality during the construction phase of the Proposed Development.

Potential effect and environmental measures

5.6.2 The environmental measures will include a site investigation to inform the need for additional mitigation within the Proposed Development. The site investigation and associated mitigation measures will be agreed with the regulators, including the EA, Thanet District Council (TDC) and other stakeholders as appropriate, and incorporated into the final development as outlined in **Table 5.5**.

Table 5.5 Land Quality Measures to be incorporated during the Construction Phase

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Humans /Surface (coastal) and ground water	Mobilisation of and exposure to existing potential contamination through soil disturbance, generation of dust during construction activities	The works will be carried out in accordance with relevant ***Construction Design Management (CDM) Regulations 2015***[12].

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		An intrusive investigation will be carried out. The findings of the intrusive investigation will inform the package of measures to be included within the detailed design. Any removal of contamination beneath the existing runway will be risk based and will weigh advantages of contamination removal against removal of the runway. A survey (pre- site preparation survey as defined by the HSE) and removal of asbestos containing materials, and other materials and structures contaminated with asbestos fibres, are expected to be performed by a competent/licensed contractor prior to any demolition works. For site workers and visitors, the potential for exposure to contaminants will be mitigated by the ***Control of Substances hazardous to Health (COSHH) Regulations 2002***[13] and the ***Management of Health and Safety at Work Regulations 1999***[14] and controlled through good construction practices such as site induction, good hygiene practices, dust suppression (especially in loading / unloading bays and tracks), requirement for Personal Protective Equipment (PPE) suitable to prevent exposure and/or restricted access during higher risk activities. A watching brief will be in place during demolition (existing buildings and infrastructure), ground and construction works. If unexpected contamination (e.g. from historical site activities) is encountered or suspected, the works will cease in that area and assessment by a suitably qualified land contamination specialist will be made to determine appropriate actions. Soil (soil vapour/ groundwater) samples will be collected and analysed. The risks associated with contamination will be assessed. When required, a remediation strategy will be designed and agreed following consultation with the EA and the relevant local authority as appropriate before implementation. Any construction activity with the potential to produce or release dusts will be assessed and dust avoided where possible through design, or, if unavoidable will be controlled on-site using construction good practice to prevent site users and neighbouring site occupiers being exposed to contaminants. Site access points will be regularly cleaned to prevent build-up of dust and mud. Any imported landscaping material will be clean and free of contaminants and of suitable thickness. Site access points will be regularly cleaned to prevent build-up of dust and mud. Earth movement will be controlled to reduce the risk of silt combining with the site run-off. Properly contained wheel wash facilities will be used (where required) to isolate sediment rich run-off. Cut-off ditches and/or geotextile silt-fences will be installed around excavations, exposed ground, stockpiles to prevent the uncontrolled release of sediments from the site. Sediment traps will be required on all surface water drains in the surrounding region. Silty water abstracted during excavations will be discharged to settlement tanks or siltbusters as appropriate. Cleaned run-off will be discharged through the existing foul sewer drains. If sewer

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		capacity is limited then silty water will need to be stored and removed from the site by tanker and disposed of at a suitably licensed location. A discharge consent for discharge to foul sewer, detailing volumes and rates of discharge will be agreed with SW prior to the commencement of works, if necessary. Stockpiles and material handling areas will be kept as clean as practicable to avoid nuisance from dust. Dusty materials will be dampened down using water sprays in dry weather or covered.
Humans / Soils/ Surface (coastal) and ground water	Exposure to contaminants/ Pollution incidents resulting from spillage due to spillages of oils and other chemicals associated with the construction process	The risks from accidental spillages/leaks during handling and storage of chemicals and fuels will be mitigated by the ***COSHH Regulations 2002***[15] and the ***Management of Health and Safety at Work Regulations 1999***[16]. Fuel, oil and chemical storage and handling will be minimised in the design of the works and safe working procedures / method statements for handling fuel and minimising the potential for spillage will be put in place, for instance by emptying and properly decommissioning fuel tanks prior to removal. The risks from accidental spillages/leaks during handling and storage of chemicals and fuels will be mitigated by pollution prevention measures and good working practices in accordance with current guidelines. Wherever possible, plant and machinery will have drip trays beneath oil tanks / engines / gearboxes / hydraulics which will be checked and emptied regularly and correctly disposed of via a licensed waste disposal operator. Oils and hydrocarbons will be stored in designated locations outside of SPZ1 with specific measures to prevent leakage and release of their contents, including the siting of the storage area away from the drainage system on an impermeable base, with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked when not in use. A PICP will be produced, which site staff will have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material. The bulk of the existing runways and taxiways will be kept as they afford protection to the adit in SPZ1. In order to mitigate against any potential FOD hazard (a concern raised by the CAA), it is proposed to overlay the extended paved area with asphalt as part of the initial construction phase. See Table 5.3 for work on the runway and close proximity to the Western Adit.
Humans / Buildings and services	Discovery and potentially explosion of UXO associated with construction process	A detailed Unexploded Ordnance (UXO) threat and risk assessment will be carried out in accordance with CIRIA C681 Chapter 5[17] on managing UXO risks prior to any intrusive works such as a ground investigation and the re-development of the site to determine any mitigation required to address this risk. This will be done in a phased approach, with additional assessment carried out as part of the site investigation. Future work relating to UXO will follow CIRIA guidelines.

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Soils / Ground water	Pollution incidents resulting from the release of contaminants from building materials or construction activities	During the site works tendering process the expected level of environmental control will be included in the tender documents, so that all contractors allow for mitigation measures in their work scope. Suitably qualified and experienced geo-environmental engineers would be used to supervise the ground works. Designated washdown areas outside of SPZ1 with fully contained drainage will be used for plant/vehicles in contact with contaminated soils to avoid contaminants being moved around the site or taken off-site. The foundation excavations will be dewatered by pumping if required. The water will be collected in suitable tanks and held on site for collection by a licensed waste contractor. No water from foundation dewatering operations will be discharged directly to ground. If required, any discharge would occur under the appropriate regulator's consent. The risks will be mitigated through specification of impermeable concrete to the appropriate British Standard to minimise any potential adverse impacts.
Ground and coastal water	Pollution incidents due to creation of pathways for the migration of potential contamination	Suitable foundation design and piling methods will be implemented to prevent migration of any potential/residual contamination and will be agreed with SW and the EA prior to the commencement of works. Piling methods will be in accordance with ***Piling and Preventative Ground Improvement Methods on Land Affected by Contamination: Guidance on pollution prevention***[18] and ***Piling into contaminated sites***[19]. Any removal of contamination beneath the existing runway will be risk based and will weigh advantages of contamination removal against removal of the runway. Remediation of potential residual contaminants at the Jentex tank farm will be undertaken, subject to risk-based assessment. For restrictions on intrusive works see Table 5.3 above.
Humans / Groundwater/ coastal water	Pollution incidents due to removal of tanks during construction phase	Safety precautions will be implemented and will include preparing an emergency response plan within the site health and safety documentation. Remediation of potential residual contaminants at the Jentex tank farm will be undertaken, subject to risk-based assessment.
Surface (coastal) and ground water	Pollution incidents resulting from concrete batching and cement products on site during the construction process.	Any mixing and handling of wet concrete that is required on-site will be undertaken in designated areas outside of SPZ1. A designated area, the location and configuration of which will be agreed following consultation with the EA, will be used for any washing down or equipment cleaning associated with concrete or cementing processes and facilities provided to remove sediment prior to disposal to foul sewer. Any contaminated soil will be identified by ground investigation prior to construction and either treated onsite and reused, or removed – subject to risk-based

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		assessment - and disposed of off-site by a suitably licensed waste disposal operator. Measures such as cut-off trenches will be put in place to prevent any potentially polluted run-off from within the site entering any excavations.

5.6.3 In addition, the following measures will be implemented during the construction phase:

- For existing fuel storage decommissioning phase:
  - All services will be traced;
  - All fuel lines and tanks will be emptied, cleaned and degassed prior to removal; and
  - The management of soil contamination will be informed by the site investigation to define and delineate impacted areas.
- For new fuel storage commissioning phase:
  - A commissioning plan will be designed and followed; and
  - All lines and tanks will be checked by competent people prior to commissioning.

5.7 Landscape and Views

Objective

5.7.1 To implement environmental measures so that adverse effects on landscape and visual amenity are avoided, reduced or compensated for as far as practicable during the construction phase of the Proposed Development, as shown in **Table 5.6**.

Potential effect and environmental measures

5.7.2 It should be noted that the environmental measures incorporated into the design of the Proposed Development at this stage of design maturity largely take the form of guiding principles and generic measures which have been used to inform the outline design (as is standard practice). These principles are subject to a continuous process of refinement and will be incorporated into a set of Manston Airport Design Principles that will be used to ensure that all elements of the Proposed Development are designed to a high standard.

Table 5.6 Landscape Measures to be incorporated during the Construction Phase

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Landscape elements: trees within the site boundaries	Potential loss or damage to valued vegetation (including tree roots as a result of construction activity) and screening elements.	Vegetation /tree survey and protection plans considered as part of the design process. Construction activities to be carried out in accordance with ***BS 5837: 2012 Trees in relation to design, demolition and construction***[20]. Recommendations in order to protect trees and other vegetation which is to be retained. New tree planting to be undertaken to replace that lost. The design of new planting has been located to deliver screening and softening of large-scale built form and is proposed along the southern side of Manston Road

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		(north of the Cargo Facilities) and around the Aviation Business Park. Further planting is proposed east of Spitfire Way. Typical proposed species are likely to be native and non-berrying so as to reduce bird attraction. The width of the planted buffers along the perimeter of the business park is typically 45m whilst elsewhere it ranges from 25-30m with planting densities at 4m centres in line with recommendations from the CAA.
Landscape character	Direct or indirect effects on valued characteristics, special qualities and character.	Incorporation of enhanced landscape/architectural design, the provision of a landscape masterplan and landscape management to reduce effects of landscape character and ensure that the nature of these effects is neutral or positive as far as possible. The use of building materials, detailing and finish for the roofs and facades of proposed buildings that respond in a positive way to the existing landscape context. However, these details are not yet available so cannot be used to inform the assessment. In terms of overflying and the potential effects on tranquillity, the noise mitigation strategy has been developed in line with the ***CAP 1520: Draft Airspace Design Guidance***[21].
All visual receptors overlapped by the ZTV within the study area	Changes to existing views, visual amenity and scenic quality: • Introduction of new large-scale features to the view; • Alteration to the landscape character of the view; • Loss of or disruption to existing views of skylines; • Changes to perceptions if movement through increased traffic (including HGV) and air movements; and • Visual effects resulting from light pollution.	The provision of screening vegetation as detailed above around the Aviation Business Park, the southern side of Manston Road (north of the Cargo Facilities) and east of Spitfire Way. Localised bunding offers further visual screening in key locations by raising the ground level for planting. It is anticipated that the design of the buildings will be of high quality and that the design treatment, detailing and materials will be used to mitigate the apparent scale and soften the appearance of the buildings. However, these details are not yet available so cannot be used to inform the assessment.

5.8 Noise and Vibration

Objective

5.8.1 To undertake the construction of the Proposed Development whilst avoiding, minimising or compensating for the adverse effects of noise and vibration.

Potential effects and environmental measures

5.8.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.7.**

Table 5.7 Noise and Vibration Measures to be incorporated during the Construction Phase

Potential Receptor	Predicted Changes and Potential Effects	Incorporated Measures	Details

Nearby residential properties and other sensitive receptors arising from construction activities	Noise and vibration from the construction of the Proposed Development and the transport of construction materials.	BPM	The developer will require its contractors to consider mitigation in the following order:
			• BPM, including:
			  • Noise and vibration control at source - for example the selection of quiet and low vibration equipment, selecting plant fitted with silencers or appropriate insulation, shutting plant down when not in use, review of construction programme and methodology to consider quieter methods, location of equipment on site, control of working hours, informing local residents of on-going construction activities, the provision of acoustic enclosures and the use of less intrusive alarms (e.g. pink noise reversing alarms, broadband vehicle reversing warnings); and
			  • Screening - for example local screening of equipment, perimeter hoarding or the use of temporary stockpiles.
			The recommendations of BS 5228 Code of practice for noise and vibration control on construction and open sites parts 1 and 2, will be implemented, together with the specific requirements of this CEMP.

Nearby residential properties and other sensitive receptors arising from construction activities	Noise and vibration from the construction of the Proposed Development and the transport of construction materials.	Noise and vibration management	The effects of noise and vibration from construction sites will be controlled by introducing management and monitoring processes to ensure that BPM are planned and employed to minimise noise and vibration during construction. Contractors will prepare a noise and vibration management plan which will set out these processes. The plan will include management and monitoring processes to ensure as a minimum: • Integration of noise control into the preparation of method statements; • Ensuring proactive links between noise management activities and community relations activities (see Section 5); • Preparing details of site hoardings, screens or bunds that will be put in place to provide acoustic screening during construction, together with an inspection and maintenance schedule for such features; • Preparing risk assessments to inform structural surveys of buildings and structures which may be affected by vibration from construction; • Developing a noise and vibration monitoring protocol including a schedule of noise and vibration monitoring locations and stages during construction of the Proposed Development when monitoring will be undertaken; • Preparing and submitting Section 61 consent applications; • Undertaking and publishing all monitoring required to ensure compliance with all acoustic commitments and consents; and

Potential Receptor	Predicted Changes and Potential Effects	Incorporated Measures	Details
			• Implementing management processes to ensure ongoing compliance, improvement and rapid corrective actions to avoid any potential non-compliance.
Nearby residential properties and other sensitive receptors arising from construction activities	Noise and vibration from the construction of the Proposed Development and the transport of construction materials.	Section 61 consents	Contractors will seek to obtain consents from the relevant local authority under Section 61 of the ***Control of Pollution Act 1974***[22] for the proposed construction works, excluding non-intrusive surveys. Applications will normally be made to the relevant local authority for a Section 61 consent at least 28 days before the relevant work is due to start. Details of construction activities, prediction methods, location of sensitive receivers and noise and vibration levels will be discussed with the relevant local authority, or authorities, both prior to construction work and throughout the construction period. Prediction, evaluation and assessment of noise and vibration as well as discussion between the Developer and its contractors and the relevant local authority will, by necessity, continue throughout the construction period. Annex 1 of BS 5228 Code of practice for noise and vibration control on construction and open sites parts 1 and 2 provides a flow diagram demonstrating the process of a Section 61 application. The Developer will seek to agree with local authorities a common format and model consent conditions for Section 61 applications or any dispensations and variations to an existing consent. The application for a Section 61 consent will require noise assessments to be undertaken and BPM measures set out to minimise noise associated with construction of the Proposed Development. The Developer's lead contractors will submit the assessment initially to the Developer for review, prior to submission to the relevant local authority. The Developer's contractors will carry out noise (and vibration where appropriate) predictions for Section 61 applications. An assessment of the predicted levels will be carried out with reference to the ES **Chapter 12: Noise and Vibration**.

5.9 Socio-Economic

Objective

5.9.1 To undertake the construction of the Proposed Development whilst avoiding, minimising or compensating for the adverse effects and to enhance anticipated positive effects of the proposed development.

Potential effect and environmental measures

5.9.2 The following potential effects and associated environmental measures to be incorporated during the construction phases are outlined in **Table 5.8.**

Table 5.8 Socio-Economic Measures to be incorporated during the Construction Phase

Potential Receptors	Predicted Changes and Potential Effects	Incorporated Measures
Local Population: Individuals of Working Age	Generation of employment opportunities in the construction sector and within airport related industries. Reduction in levels on unemployment within the local area (i.e. Thanet).	Measures to optimise local recruitment during construction, including possible measures to ensure linkages to local training initiatives and/or voluntary agreements relating to local recruitment.
Local Businesses	Disruption to the local road network during construction impacting on employee and customer access. Increase in economic activity as a result of temporary construction workers and further, via influx of passengers using the Proposed Development. Construction activities will lead to an increase in spending in the local economy by contractors and airport employees.	Carefully designed programme of traffic management during construction to minimise disruption. Specific measures are outlined within the Construction Traffic Management Plan (CTMP) appended to the Traffic Assessment (TA). Scope for additional measures to optimise the spending by contractors in the local economy during the construction phase of the Proposed Development, by voluntary measures to place contracts with local firms and purchase from local suppliers.
Tourism	Disruption to the local road network during construction impacting on employee and visitor access.	Carefully designed programme of traffic management to minimise disruption. Specific measures are outlined within the CTMP appended to the TA.

5.10 Traffic and Transport

Objective

5.10.1 To undertake the construction of the Proposed Development whilst minimising disruption to public travel and effects on the condition of the highways.

Potential effect and environmental measures

5.10.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.9**.

Table 5.9 Environmental Measures to be incorporated for the Construction Phase

Potential Receptors	Predicted Changes and Potential Effects	Incorporated Measures
Construction		
The users of local roads and the occupiers of land uses fronting roads likely to be affected	Changes in the character of traffic (such as increases in HGVs), as a result of proposed construction traffic. Potential effects on: • Severance; • Driver delay; • Pedestrian delay; • Pedestrian amenity; and • Accidents and safety.	A CTMP will be agreed with KCC prior to construction works commencing. The CTMP would seek to keep construction traffic on the strategic highway network and avoid sensitive routes and local communities in order to minimise impacts on receptors and manage environmental effects. The CTMP will manage the daily delivery profiles and control movements and routeing of HGVs through the following measures:

Potential Receptors	Predicted Changes and Potential Effects	Incorporated Measures
		• Traffic routing strategy – ensuring vehicles access the site via the most appropriate route and avoid unnecessary conflict with sensitive areas; • Traffic timing strategy – programme vehicle arrival/departures and working hours to lessen the impact on the highway network; • Temporary signage – in accordance with the Department for Transport ***Traffic Signs Manual, Chapter 8***[23] to inform local road users of construction access points and the presence of HGVs; • Temporary traffic management – provided on approaches to accesses in the form of traffic warning signs, possible reductions in speed limit signs to ensure safe passage of vehicles; • Site accesses designed in accordance with ***Design Manual for Roads and Bridges 42/95 Geometric Design of Major/Minor Priority Junctions***[24]; and • Staff travel plan – will provide details of how staff will travel to the site by alternative modes in an effort to reduce single occupancy vehicles travelling to the site.

5.11 Climate Change

Objective

5.11.1 To undertake the construction of the Proposed Development whilst minimising emissions of Greenhouse gases (GHGs) that contribute to climate change.

Potential effect and environmental measures

5.11.2 The following potential effects and associated environmental measures to be incorporated during the construction phase are outlined in **Table 5.10.**

Table 5.10 Environmental Measures to be incorporated for the Construction Phase

Topic Area	Projected Changes and Potential Effects	Incorporated Measures
Construction Phase		
Biodiversity (Chapter 7)	Climate change impacts on vegetation in compensation areas for SPI/red-listed bird species.	To ensure that the conservation status of SPI/red-listed birds of conservation concern is maintained, appropriate habitat, using plant species appropriate for the changing climate, will be created prior to commencement of construction within the c.36 ha compensation site (land parcel 1362) south of the Proposed Development. The arable area within the compensation field will contain 'skylark plots' at a density of 2 per ha.
Biodiversity (Chapter 7)	Climate change impacts on vegetation resilience	The habitat creation will use species of local provenance adapted to local conditions to increase resilience to climate change impacts. In the long-term, monitoring will determine if new native species better adapted and more resilient to climate change are required and management will be amended accordingly.

Topic Area	Projected Changes and Potential Effects	Incorporated Measures
Freshwater Environment (Chapter 8)	Overwhelming of local drainage system in future flooding events.	The EA have agreed under the site drainage strategy that the drainage system will be designed so that there would be no offsite flooding for a 1% Annual Exceedance Probability) AEP event with a 40% climate change allowance (scenario agreed with KCC as Lead Local Flood Authority (LLFA)). All surface water will be captured, attenuated within two ponds, treated and then discharged to Pegwell Bay via an existing pump and outfall.
Land Quality (Chapter 10)	Overwhelming of local drainage system in future flooding events. Contaminated run-off generated by de-icer storage and use enters the groundwater environment as a potential pollutant.	Storage lagoons will be appropriately sized to account for National Planning Policy Framework (NPPF)[25] climate change allowances, to ensure that treatment facilities continue to function.

5.11.3 A summary of the environmental measures that have been incorporated into the development proposals to date in order to avoid, reduce or compensate for potential adverse GHG effects is provided below in **Table 5.11.**

Table 5.11 Rationale for incorporation of Environmental Measures

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Construction Phase		
Global atmosphere	Potential GHG emissions from vehicles and plant during the construction phase	The contractor will include measures to reduce or limit air quality effects during the construction phase of the Proposed Development. Measures will include avoiding the use of diesel or petrol-powered generators and use mains electricity or battery-powered equipment where practicable; ensuring all vehicles switch off engines when stationary — no idling vehicles.
Global atmosphere	Changes in the character of traffic (such as increases in HGVs) as a result of proposed construction traffic	A CTMP would be agreed with KCC prior to construction works commencing. The CTMP would seek to keep construction traffic on the strategic highway network and avoid sensitive routes and local communities in order to minimise impacts on receptors and manage environmental effects.

5.12 Major Accidents and Disasters

Objective

5.12.1 To undertake the construction of the Proposed Development whilst minimising the potential for accidents and disasters to arise.

Potential effect and environmental measures

5.12.2 A summary of the environmental measures that have been incorporated into the development proposals to date in order to avoid, reduce or compensate for potential adverse accident and disaster effects is provided below in **Table 5.12**.

Table 5.12 Environmental Measures to be incorporated for the Construction Phase

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
Land, surface and ground water (including particular species, designated sites and habitats)	Large accidental spillages of oils and other chemicals (including those associated with firefighting) associated with the construction process, escalation from external or airport based event or natural disaster entering the environment (land or water) as a potential pollutant to cause a major accident.	Fuel, oil and hazardous chemical storage and handling will be minimised in the design of the works and safe working procedures / method statements for handling these substances and minimising the potential for spillage will be put in place. Tanks and stored chemicals will be located away from excavation and high vehicle movements. Oils, chemicals and fuels will be stored in designated locations with specific measures to prevent leakage and release of their contents into water receptors, including the siting of the storage area away from the drainage. Any large quantity of fuel, chemical, oil (including those of waste) will be located away from the SPZ1 area and drainage routes to Pegwell Bay. Risks arising from interaction with the operational airport and its facilities (post Phase 1), including communication and control of temporary changes, will be controlled by good working practices. These may include, but are not limited to the following: • Appropriate waste management, including its segregation, is undertaken; • Site rules are followed by all those on site; • Appropriate training is taken and competency tested; • Risk assessments are completed, considering both operational spillages and sources with major accident/disaster potential; and • All chemicals and flammable products are appropriately stored and contained. Construction risk management processes with risk reduction to ALARP and adoption of inherent safe design approaches for environmental major accidents and disaster hazards. This will include: • Identification of major accident and disaster hazards; • Access consequences and frequency; • Ensure all risk is ALARP or broadly acceptable by review of all hazards, considering additional measures and implementing all that provide benefit without gross disproportion to the cost. All measures should be considered based on hierarchy of control (i.e. prevention through to emergency response, recovery and remediation). Management of Change Procedures to be developed within the Airport Safety and Environmental Management System to support Post Phase 1 construction. The Construction Emergency Plan will incorporate major accidents and disasters and their response arrangements. A SWMP and procedures.

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		Traffic controls and management with collision barriers will be provided where required (as further outlined in the CTMP and summarised in **Section 3.5** and **Section 5.10**). Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found, a plan will be developed for their controlled removal. Secure site with restricted access.
Land, surface and ground water (including particular species, designated sites and habitats)	Structural/equipment/civils collapse associated with the construction process, escalation from external or airport event, or natural disaster on the Proposed Development leading to hazardous substances entering the environment (land or water) as a potential pollutant.	The risks from construction activities will be mitigated by measures determined by a construction risk assessment in accordance with the ***CDM Regulations 2015***[26] and good working practices (as outlined above)**.** Adoption of inherent safe design principles in the design plan. Construction risk management with risk reduction to ALARP for environmental major accidents and disasters. Risks arising from interaction with the operational airport and its facilities (post Phase 1), including communication and control of temporary changes, will be controlled by good working practices (as outlined above). The Emergency Plan will incorporate the identified major accidents and disasters and their response arrangements. Management of Change Procedures to be developed within the Airport Safety and Environmental Management System to support Post Phase 1 construction. Traffic controls and management with collision barriers will be provided where required (as further outlined in the CTMP and summarised in **Section 3.5** and **Section 5.10**). Secure site with restricted access. Historical site risk from previous activities (e.g. UXO) and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal.
Populations and their buildings	Serious harm (multiple serious injury or fatality) to people on or off site during construction (e.g. fire, exposure to harmful substances, collision, structural collapse, transport risk). Exposure to natural disasters or escalation of external events (e.g. extreme weather, consequences of seismic events, third party fire, widespread pandemic or urban action) leading to injuries and loss of life.	Equipment and storage measures as outlined for 'Land, Surface and Groundwater' above. Flammable materials and dangerous chemicals will be stored in a secure location, contained and away from populations, and the public. Control of ignition for flammable materials as required under ***The Dangerous Substances and Explosive Atmospheres Regulations 2002***[27]. Management of major accident hazards through construction risk assessment, in accordance with ***CDM Regulations 2015***[28] and good working practices (as outlined above). This will include adoption of inherent safe design principles in the design plan and an Emergency Plan to cover construction activities.

Potential Receptors	Predicated Changes and Potential Effects	Incorporated Measures
		Risks arising from interaction with the operational airport and its facilities (post Phase 1), including communication and control of temporary changes, will be controlled by good working practices (e.g. set out in the Safety Health and Environment (SHE) Plan). Management of Change Procedures to be developed within the Airport Safety and Environmental Management System to support Post Phase 1 construction. Construction risk management processes with risk reduction to ALARP and adoption of inherent safe design approaches for major accidents and disaster hazards to people (set out in the SHE Plan). The Emergency Plan will incorporate the identified major accidents and disasters and their response arrangements. Traffic controls and management with collision barriers will be provided where required (as further outlined in the CTMP and summarised in **Section 3.5** and **Section 5.10**). Secure site with restricted access.
Populations and their buildings	Discovery of historical issues: potential explosion of UXO or ground instability (e.g. revealed tunnelling).	Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal. Management of hazards through construction risk assessment in accordance with ***CDM Regulations 2015***[29] and good working practices in accordance with current guidelines. This will include adoption of inherent safe design principles in the design plan and an Emergency Plan to cover construction activities.
Designated Heritage Assets	Serious damage to designated heritage assets. Potential sources of major accident, including fire and excavation.	Details of specific measures are provided in **section 5.5**.

Appendix A
CEMP Review Table

Appendix A – CEMP Review Table

Proposed Review Period	Due Date of Review	Actual Date of Review	Sections Amended	CEMP issue number	Reviewed by		
					Project Manager / Supervisor	Contractor's Project Director	Contractors Environmental Manager

Appendix B
Draft of Register of Contents Legal Responsibilities

Appendix B – Draft Register of Consents and Legal Responsibilities

Environmental Topic	Consent Licence / Permit Type	Description	Consent Granting Body	Responsibility	Date Required	Programme Risk	Additional Comments

Appendix C
Emergency Contact Details Template

Appendix C – Emergency Contact Details Template

Name	Company	Person	Contact Number(s)	Contact Address
Project Hotline				
Employer				
Contractor				
Contractor's Project Manager / Supervisor				
Environmental Manager				
Environmental Co-ordinator				
Waste Management Contractor				
Fire Service				
Environment Agency				
Water Company				
Gas Supplier				
Electricity Supplier				
Telephone / Internet Provider				
Other Utilities				
Specialist Clean-up Contractor				

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Appendix 3.3
Aircraft Forecast

Carrier	Aircraft type	Aircraft Type Description	ICAO Aircraft Approach Category	Maximum Landing Weight (metric tons)	Mean Sector Length (km)	Flight Type	% Night	% Day	Busy Day Multiplier
Amazon	76V	Boeing 767-400	D	159	5555	Freight	10.00%	90.00%	1
Amazon	77X	Boeing 777-200	E	224	5555	Freight	10.00%	90.00%	1
Cargolux (Africa/Nairobi)	748	Boeing 747-800	F	306	6828	Freight	10.00%	90.00%	1
Cathay Pacific Freight	77X	Boeing 777-200	E	224	9648	Freight	10.00%	90.00%	1
Chinese airlines	77X	Boeing 777-200	E	224	8175	Freight	10.00%	90.00%	1
Emirates SkyCargo	77X	Boeing 777-200	E	224	5505	Freight	10.00%	90.00%	1
FedEx or DHL etc	76Y	Boeing 767-300	D	136	7026	Freight	25.00%	75.00%	1
FedEx or DHL etc	752	Boeing 757-200	D	90	352	Freight	25.00%	75.00%	1
FedEx or DHL etc	332	Airbus A330-200	E	180	5523	Freight	25.00%	75.00%	1
FedEx/DHL feeders (including Gibraltar)	AT7	ATR 72	C	22	348	Freight	10.00%	90.00%	1
Fresh fish and spider crabs (Dubai)	77X	Boeing 777-200	E	224	5505	Freight	0.00%	100.00%	2
Iran Air (Tehrain)	77X	Boeing 777-200	E	224	4432	Freight	0.00%	100.00%	2
Live animal operations	77X	Boeing 777-200	E	224	5505	Freight	0.00%	100.00%	1
Middle Eastern airlines e.g. EgyptAir, Saudia Cargo	77X	Boeing 777-200	E	224	3536	Freight	10.00%	90.00%	2
Pakistan International Airlines	77X	Boeing 777-200	E	224	6080	Freight	10.00%	90.00%	1
Postal Services	73H	Boeing 737-800	C	65	534	Freight	50.00%	50.00%	1
Qatar Airways	77X	Boeing 777-200	E	224	5245	Freight	0.00%	100.00%	1
Russian airlines	744	Boeing 747-400	E	296	2553	Freight	10.00%	90.00%	1
TAAG Angola Airlines	744	Boeing 747-400	E	296	6812	Freight	10.00%	90.00%	1
TAAG Angola Airlines	748	Boeing 747-800	F	306	6812	Freight	10.00%	90.00%	1
Other Freight Operations	73Y	Boeing 737-300	C	53	424	Freight	10.00%	90.00%	1
Military Freighter Movements	C17	Boeing C-17 Globemaster III	D	203	4749	Freight	0.00%	100.00%	1
Military Freighter Movements	LOH	Lockheed L-100 Hercules	D	70	4749	Freight	0.00%	100.00%	1
Humanitarian and Medivac	744	Boeing 747-400	E	296	3583	Freight	10.00%	90.00%	1
Humanitarian and Medivac	748	Boeing 747-800	F	306	3583	Freight	10.00%	90.00%	1
Recycling aircraft	320	Airbus A320	C	68	0	Freight	0.00%	100.00%	1
KLM	F70	Fokker 70	C	37	259	Passenger	0.00%	100.00%	1
Generic Charter Market	320	Airbus A320	C	68	1315	Passenger	0.00%	100.00%	2
Blue Air	73H	Boeing 737-800	C	65	1984	Passenger	0.00%	100.00%	2
Cruise Flights (and Florida Flights)	753	Boeing 757-300	D	102	7105	Passenger	0.00%	100.00%	2
EasyJet	320	Airbus A320	C	68	846	Passenger	0.00%	100.00%	1
EasyJet Long Haul	744	Boeing 747-400	E	296	7248	Passenger	0.00%	100.00%	1
Ryanair	73H	Boeing 737-800	C	65	1133	Passenger	0.00%	100.00%	1.1
Iran Air	332	Airbus A330-200	E	180	4306	Passenger	0.00%	100.00%	1

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Carrier	**Aircraft type**	**0**	**5252**	**10736**	**14724**	**15000**	**16846**	**17626**	**17938**	**18146**	**18354**
Amazon	76V	0	520	520	1248	1248	0	0	0	0	0
Amazon	77X	0	0	0	0	0	1248	1248	1248	1248	1248
Cargolux (Africa/Nairobi)	748	0	208	312	312	312	312	312	312	312	312
Cathay Pacific Freight	77X	0	0	0	0	0	0	0	0	0	0
Chinese airlines	77X	0	0	0	0	0	0	0	0	0	0
Emirates SkyCargo	77X	0	0	0	0	0	0	0	0	0	0
FedEx or DHL etc	76Y	0	624	624	1352	1352	1352	0	0	0	0
FedEx or DHL etc	752	0	624	624	1352	1352	1352	1352	1352	1352	1352
FedEx or DHL etc	332	0	0	0	0	0	0	1352	1352	1352	1352
FedEx/DHL feeders (including Gibraltar)	AT7	0	1456	1456	2912	2912	2912	2912	2912	2912	2912
Fresh fish and spider crabs (Dubai)	77X	0	52	52	52	52	52	52	52	52	52
Iran Air (Tehrain)	77X	0	520	520	520	520	520	520	520	520	520
Live animal operations	77X	0	52	52	104	104	104	104	104	104	104
Middle Eastern airlines e.g. EgyptAir, Saudia Cargo	77X	0	64	96	96	128	128	128	128	128	128
Pakistan International Airlines	77X	0	48	48	48	48	48	48	48	48	48
Postal Services	73H	0	312	520	520	520	520	520	520	520	520
Qatar Airways	77X	0	200	200	300	400	400	400	400	400	400
Russian airlines	744	0	208	312	416	416	520	624	728	728	832
TAAG Angola Airlines	744	0	200	200	200	200	200	200	200	200	200
TAAG Angola Airlines	748	0	0	0	0	0	0	0	0	0	0
Other Freight Operations	73Y	0	104	208	208	312	416	1040	1248	1456	1560
Military Freighter Movements	C17	0	15	15	15	15	15	15	15	15	15
Military Freighter Movements	LOH	0	15	15	15	15	15	15	15	15	15
Humanitarian and Medivac	744	0	20	20	20	20	20	20	20	20	20
Humanitarian and Medivac	748	0	0	0	0	0	0	0	0	0	0
Recycling aircraft	320	0	10	10	10	10	10	10	10	10	10
KLM	F70	0	0	1456	1456	1456	1456	1456	1456	1456	1456
Generic Charter Market	320	0	0	120	120	120	120	120	120	120	120
Blue Air	73H	0	0	80	120	160	160	160	160	160	160
Cruise Flights (and Florida Flights)	753	0	0	0	52	52	52	104	104	104	104
EasyJet	320	0	0	0	0	0	0	0	0	0	0
EasyJet Long Haul	744	0	0	0	0	0	0	0	0	0	0
Ryanair	73H	0	0	3276	3276	3276	4914	4914	4914	4914	4914
Iran Air	332	0	0	0	0	0	0	0	0	0	0

		Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
		2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Carrier	**Aircraft type**	**19030**	**19733**	**20464**	**21224**	**22015**	**22837**	**23693**	**24582**	**25507**	**26469**
Amazon	76V	0	0	0	0	0	0	0	0	0	0
Amazon	77X	1298	1350	1404	1460	1518	1579	1642	1708	1776	1847
Cargolux (Africa/Nairobi)	748	324	337	351	365	380	395	411	427	444	462
Cathay Pacific Freight	77X	0	0	0	0	0	0	0	0	0	0
Chinese airlines	77X	0	0	0	0	0	0	0	0	0	0
Emirates SkyCargo	77X	0	0	0	0	0	0	0	0	0	0
FedEx or DHL etc	76Y	0	0	0	0	0	0	0	0	0	0
FedEx or DHL etc	752	1406	1462	1521	1582	1645	1711	1779	1850	1924	2001
FedEx or DHL etc	332	1406	1462	1521	1582	1645	1711	1779	1850	1924	2001
FedEx/DHL feeders (including Gibraltar)	AT7	3028	3150	3276	3407	3543	3685	3832	3985	4145	4310
Fresh fish and spider crabs (Dubai)	77X	54	56	58	61	63	66	68	71	74	77
Iran Air (Tehrain)	77X	541	562	585	608	633	658	684	712	740	770
Live animal operations	77X	108	112	117	122	127	132	137	142	148	154
Middle Eastern airlines e.g. EgyptAir, Saudia Cargo	77X	133	138	144	150	156	162	168	175	182	189
Pakistan International Airlines	77X	50	52	54	56	58	61	63	66	68	71
Postal Services	73H	541	562	585	608	633	658	684	712	740	770
Qatar Airways	77X	416	433	450	468	487	506	526	547	569	592
Russian airlines	744	865	900	936	973	1012	1053	1095	1139	1184	1232
TAAG Angola Airlines	744	0	0	0	0	0	0	0	0	0	0
TAAG Angola Airlines	748	208	216	225	234	243	253	263	274	285	296
Other Freight Operations	73Y	1622	1687	1755	1825	1898	1974	2053	2135	2220	2309
Military Freighter Movements	C17	16	16	17	18	18	19	20	21	21	22
Military Freighter Movements	LOH	16	16	17	18	18	19	20	21	21	22
Humanitarian and Medivac	744	21	22	0	0	0	0	0	0	0	0
Humanitarian and Medivac	748	0	0	22	23	24	25	26	27	28	30
Recycling aircraft	320	10	11	11	12	12	13	13	14	14	15
KLM	F70	1456	1456	1456	1456	1456	1456	1456	1456	1456	1456
Generic Charter Market	320	125	130	135	140	146	152	158	164	171	178
Blue Air	73H	166	173	180	187	195	202	211	219	228	237
Cruise Flights (and Florida Flights)	753	108	112	117	122	127	132	137	142	148	154
EasyJet	320	0	0	0	0	0	0	0	0	0	0
EasyJet Long Haul	744	0	0	0	0	0	0	0	0	0	0
Ryanair	73H	5111	5315	5528	5749	5979	6218	6466	6725	6994	7274
Iran Air	332	0	0	0	0	0	0	0	0	0	0

Appendix 4.1

Planning Policy Context

4.1 Introduction

4.1.1 This Appendix has been prepared by RPS and sets out the relevant national, regional and strategic local planning policies in order to establish the policy context against which the proposals for the re-opening of Manston Airport need to be considered.

4.2 National Planning Policy

National Planning Practice Guidance (NPPG)

4.2.1 On 6 March 2014, the Department for Communities and Local Government (DCLG) (now Ministry of Housing, Communities and Local Government) launched the planning practice guidance web-based resource. This was accompanied by a Written Ministerial Statement which included a list of the previous planning practice guidance documents cancelled when the site was launched. The planning practice guidance will be updated as needed on a rolling basis. The web-based resource was developed following the recommendations of the External Review of Planning Practice Guidance which the Government previously consulted on. The purpose of publishing the web-based resource is to bring together planning practice guidance for England in an accessible and useable way as National Planning Practice Guidance (NPPG).

4.2.2 In terms of planning practice guidance as it relates to aviation and airport planning, the NPPG does not introduce any additional guidance beyond that which is already captured by the National Planning Policy Framework (NPPF).

National Planning Policy Framework – Draft Text for Consultation (March 2018)

4.2.3 The draft revised National Planning Policy Framework (NPPF) published in March 2018 incorporates policy proposals previously consulted on in the Housing White Paper and the Planning for the Right Homes in the Right Places Consultation (September 2017). The consultation closes on the 10th May 2018. The revised NPPF is expected to be adopted in July 2018.

4.2.4 The draft revised NPPF continues to set out the Government’s planning policies for England and how these are to be applied (paragraph 1) and continues to state that planning law requires applications to be determined in accordance with the Development Plan unless material considerations indicate otherwise (paragraph 2). Paragraph 2 further confirms that the NPPF is a material consideration in planning decisions.

4.2.5 Paragraph 4 specifically states that the NPPF does not contain specific policies for NSIPs and that these are determined in accordance with the decision-making framework set out in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the NPPF). It also states that NPSs form part of the overall framework of the national planning policy and are a material consideration in decisions on planning applications.

Achieving Sustainable Development

4.2.6 Paragraph 7 states that the purpose of the planning system is to contribute to the achievement of sustainable development. Paragraph 8 states that achieving sustainable development means that the planning system has three overarching objectives (economic, social and environmental) which are interdependent and which need to be pursued in mutually supportive ways so that opportunities can be taken to secure net gains across the different objectives. Paragraph 9 states that planning policies and decisions should play an active role in guiding development towards sustainable solutions but in doing so, should take local circumstances into account, to reflect the character, needs and opportunities of the area.

Presumption in favour of Sustainable Development

4.2.7 Paragraph 10 states that so that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development. For decision-taking, paragraph 11 states that this means approving development proposals that accord with an up-to-date development plan without delay, or where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless: i) the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or ii) any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole. Paragraph 12 reconfirms that the presumption in favour of development does not change the statutory status of the development plan as a starting point for decision making.

Strategic Policies

4.2.8 Paragraph 20 states that the strategic policies required for the area of each local planning authority should include those policies, and strategic site allocations, necessary to provide (amongst other things) infrastructure for transport.

Maintaining Effective Cooperation

4.2.9 The draft revised NPPF promotes effective cooperation and paragraph 28 especially endorses effective and on-going joint working between strategic plan making authorities and relevant bodies which it believes is integral to the production of a positively prepared and justified strategy. In particular, the draft revised NPPF states that joint working should help to determine where additional infrastructure is necessary.

Building a Strong, Competitive Economy

4.2.10 The draft revised NPPF promotes building a strong, competitive economy and paragraph 82 states that planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt. It continues by saying that significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development. The approach taken should allow each area to build on its strengths, counter any weaknesses and address the challenges of the future – and that this is particularly important where Britain can be a global leader in driving innovation, and in areas with high levels of productivity, which should be able to capitalise on their performance and potential.

Promoting Sustainable Transport

4.2.11 Section 9 of the draft revised NPPF concerns promoting sustainable transport. Paragraph 103 states that transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

a) the potential impacts of development on transport networks can be addressed;

b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;

c) opportunities to promote walking, cycling and public transport use are identified and pursued;

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for mitigation and for net gains in environmental quality; and

e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.

4.2.12 Paragraph 104 states that the planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes so that this can help to reduce congestion and emissions, and improve air quality and public health.

4.2.13 Paragraph 105(e) and 105(f) state that planning policies should:

"(e) provide for any large-scale facilities, and the infrastructure to support their operation and growth, taking into account any relevant national policy statements and whether such development is likely to be a nationally significant infrastructure project. For example, ports, airports, interchanges for rail freight, roadside services and public transport projects; and

(f) recognise the importance of maintaining a national network of general aviation facilities – taking into account their economic value in serving business, leisure, training and emergency service needs, and the Government's General Aviation Strategy."

4.2.14 Paragraph 107 states that maximum parking standards for residential and non-residential developments should only be set where there is a clear and compelling justification that they are necessary for managing the local road network.

4.2.15 Paragraph 108 specifically states that in assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;

b) safe and suitable access to the site can be achieved for all users; and

c) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

4.2.16 Paragraph 109 states that development should only be prevented or refused on highways grounds if the residual cumulative impacts on the road network or road safety would be severe.

4.2.17 Within this context, paragraph 110 states that applications for development should:

a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for the efficient delivery of goods, and access by service and emergency vehicles; and

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.

4.2.18 Paragraph 111 states that all developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.

Making Effective use of Land

4.2.19 Paragraph 118 states that planning policies and decisions should (c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated and unstable land; and (d) promote and support the development of under-utilised land and buildings.

Achieving well-designed Place

4.2.20 Paragraph 124 reinforces the need for planning policies and decisions to support the creation of high quality buildings and places.

4.2.21 Paragraph 126 states that planning policies and decisions should ensure that developments:

a) will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;

b) are visually attractive as a result of good architecture, layout and effective landscaping;

c) respond to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities);

d) establish or maintain a strong sense of place, using the arrangement of streets, spaces, building types and materials to create attractive and distinctive places to live, work and visit;

e) optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks; and

f) create places that are safe, inclusive and accessible, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesion and resilience.

4.2.22 Paragraph 127 states that applications that can demonstrate early proactive and effective engagement with the community should be looked on more favourably than those that cannot.

4.2.23 Paragraph 129 states that permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions, taking into account any local design standards in plans or supplementary planning documents. Conversely, where the design of a development accords with clear expectations in local policies, design should not be used by the decision-maker as a valid reason to object to development.

Planning for Climate Change

4.2.24 Paragraph 147 states that the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

4.2.25 Paragraph 149 states that new development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

4.2.26 Paragraph 152 states that in determining planning applications, local planning authorities should expect new development to:

a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

Planning and Flood Risk

4.2.27 Paragraph 154 states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

4.2.28 Paragraph 161 states that when determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resilient and resistant;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

4.2.29 Paragraph 163 states that major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

a) take account of advice from the lead local flood authority;

b) have appropriate proposed minimum operational standards;

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and

d) where possible, provide multifunctional benefits.

Conserving and Enhancing the Natural Environment

4.2.30 Paragraph 168 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of geological value and soils (in a manner commensurate with their statutory status or identified quality);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it;

d) minimising impacts and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

4.2.31 Paragraph 170 states that great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty. The conservation of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest.

Habitats and Biodiversity

4.2.32 Paragraph 173 states that when determining planning applications, the following principles should be applied:

a) if significant harm to biodiversity 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;

b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland) should be refused, unless there are wholly exceptional reasons and a suitable mitigation strategy exists. Where development would involve the loss of individual aged or veteran trees that lie outside ancient woodland, it should be refused unless the need for, and benefits of, development in that location would clearly outweigh the loss; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for the environment.

Ground Conditions and Pollution

4.2.33 Paragraph 176 states that planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

4.2.34 Paragraph 178 states that planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health and living conditions, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

4.2.35 Paragraph 179 states that planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

4.2.36 Paragraph 180 states that planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (including places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where an existing business or community facility has effects that could be deemed a statutory nuisance in the light of new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to secure suitable mitigation before the development has been completed.

4.2.37 Paragraph 181 states that the focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively.

Conserving and Enhancing the Historic Environment

Proposals affecting Heritage Assets

4.2.38 Paragraph 185 states that in determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

4.2.39 Paragraph 186 states that local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

4.2.40 Paragraph 188 states that in determining applications, local planning authorities should take account of:

a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;

b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and

c) the desirability of new development making a positive contribution to local character and distinctiveness.

4.2.41 Paragraph 189 states that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation, irrespective of the degree of potential harm to its significance. The more important the asset, the greater the weight should be. Paragraph 190 states that any harm or loss to a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification.

4.2.42 Paragraph 191 states that where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

a) the nature of the heritage asset prevents all reasonable uses of the site; and

b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and

c) conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and d) the harm or loss is outweighed by the benefit of bringing the site back into use.

4.2.43 Paragraph 192 states that where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal.

4.2.44 Paragraph 193 states that the effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

4.2.45 Paragraph 194 states that local planning authorities should not permit loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

National Planning Policy Framework (NPPF)

4.2.46 The NPPF was published in March 2012 and sets out the Government's planning policies for England and how these are expected to be applied (Paragraph 1). It states that planning law requires that applications must be determined in accordance with the Development Plan, unless material considerations indicate otherwise, and that the NPPF must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions (Paragraph 2).

4.2.47 Paragraph 3 specifically states that the NPPF does not contain specific policies for nationally significant infrastructure projects for which particular considerations apply. These are determined in accordance with the decision-making framework set out in the Planning Act 2008 and relevant national policy statements for major infrastructure, as well as any other matters that are considered both important and relevant (which may include the NPPF). It continues to state that National Policy Statements (NPSs) form part of the overall framework of national planning policy, and are a material consideration in decisions on planning applications. The Airports NPS is considered to be a material consideration in the determination of this DCO application (see earlier sections of this statement).

4.2.48 The Planning Act 2008 does not incorporate Section 38(6) of the Planning and Compulsory Purchase Act 2004 which provides the principle basis in law for the determination of planning applications namely that they must be determined in accordance with the Development Plan unless material considerations indicate to the contrary. The duty instead is to have regard to any Local Impact Report submitted by the relevant local authority. The local Development Plan, therefore is not the starting point for the consideration of a DCO and the extent to which it is deemed material is a matter for the Planning Inspectorate and the Secretary of State. This is discussed further in the next section of this statement.

4.2.49 The NPPF confirms that it does not affect, add to or alter the policy regime for NSIPs as set out in the NPSs. However, in the absence of a designated Airports NPS, it is important and relevant to consider the NPPF especially the following sections:

Presumption in favour of Sustainable Development

4.2.50 At the heart of the NPPF is a presumption in favour of sustainable development which in terms of decision-taking, and outside of the policy framework for determining NSIPs, normally means approving development proposals that accord with the Development Plan without delay or where the Development Plan is absent, silent or relevant policies are out-of-date, granting planning permission unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits when assessed against the policies in the NPPF taken as a whole or if specific policies in the NPPF indicate that development should be restricted (Paragraph 14).

4.2.51 Paragraph 7 explains that there are three dimensions to sustainable development - economic, social and environmental – which give rise to the need for the planning system to perform a number of roles:

- An economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure. This is especially relevant to the consideration of the appeal proposals.
- A social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and
- An environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

4.2.52 Paragraph 17 specifically addresses the role that the planning system should play and sets out a core list of land use planning principles which should underpin the plan-making and decision-taking process. These include:

"- proactively drive and support sustainable economic development to deliver… infrastructure that the country needs, making every effort to objectively identify and then meet development needs of an area, and respond positively to wider opportunities for growth…

- **encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value."**

Building a Strong, Competitive Economy

4.2.53 The NPPF clearly states that the Government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths, and in meeting the twin challenges of global competition and of a low carbon future (Paragraph 18) and that it is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Importantly in the context of this DCO application, the NPPF states that planning should operate to encourage and not act as an impediment to sustainable growth. Therefore, significant weight should be placed on the need to support economic growth through the planning system (Paragraph 19). To help achieve economic growth, the NPPF states that Local Planning Authorities should plan proactively to meet the development needs of business and support an economy fit for the 21st century (Paragraph 20).

Promoting Sustainable Transport

4.2.54 Specifically in relation to airports, the NPPF states in Paragraph 31 that local planning authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development, including large scale facilities such as rail freight interchanges, roadside facilities for motorists or transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas.

4.2.55 Paragraph 33 of the NPPF sets out the policy framework against which airport proposals should be considered and states:

> **"When planning for ports, airports and airfields that are not subject to a separate national policy statement, plans should take account of their growth and role in serving business, leisure, training and emergency service needs. Plans should take account of this Framework as well as the principles set out in the relevant national policy statements and the Government Framework for UK Aviation."**

Infrastructure

4.2.56 Paragraph 162 of the NPPF relates specifically to infrastructure and states that local planning authorities should take account of the need for strategic infrastructure including nationally significant infrastructure within their areas. It is evident from the preparation of the new Thanet Local Plan that Thanet District Council have not properly engaged with or taken into account RiverOak's proposals for reopening Manston Airport which would be a nationally significant infrastructure project that would realise both the local and regional economic growth aspirations in addition to contributing significantly to the wider UK economy.

Requiring Good Design

4.2.57 NPPF paragraph 65 outlines that:

> **"Local planning authorities should not refuse planning permission for buildings or infrastructure which promote high levels of sustainability because of concerns about incompatibility with an existing townscape, if those concerns have been mitigated by good**

design (unless the concern relates to a designated heritage asset and the impact would cause material harm to the asset or its setting which is not outweighed by the proposal's economic, social and environmental benefits)."

4.2.58 Based on the NPPF guidance it is imperative that the design is assessed against the wider sustainability benefits that the reopening of Manston Airport will provide.

Promoting Healthy Communities

4.2.59 Paragraph 69 of the NPPF looks to promote safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion. It also promotes safe and accessible developments that include clear and legible pedestrian routes, and high quality public spaces, encouraging active and continued use of public areas.

4.2.60 NPPF paragraph 70 seeks that planning decisions plan positively for the provision and use of shared space, community facilities, including cultural buildings to enhance the sustainability of communities and residential environments; any unnecessary loss of these valued facilities should be guarded against.

Meeting the Challenge of Climate Change, Flooding and Coastal Change

4.2.61 It is recognised in NPPF paragraph 93, that planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure.

4.2.62 To support the move to a low carbon future, NPPF paragraph 95 looks for local planning authorities to plan for new development in locations and ways which reduce greenhouse gas emissions and to actively support energy efficiency improvements to existing buildings.

4.2.63 NPPF paragraph 98 states that when determining planning applications, local planning authorities should:

- **not require applicants for energy development to demonstrate the overall need for renewable or low carbon energy and also recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and**
- **approve the application if its impacts are (or can be made) acceptable.**

4.2.64 New development is expected to comply with adopted Local Plan policies on local requirements for decentralised energy supply unless it can be demonstrated, having regard to the type of development involved and its design, that this is not feasible or viable. The application should also take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption. To help increase the use and supply of renewable and low carbon energy, local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources.

4.2.65 To reduce flood risk, NPPF paragraph 103 details that when determining planning applications, local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment. The development should be appropriately flood resilient and resistant, include safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.

Conserving and Enhancing the Natural Environment

4.2.66 The NPPF outlines that the planning system should contribute to and enhance the natural and local environment by:

- **protecting and enhancing valued landscapes, geological conservation interests and soils;**
- **recognising the wider benefits of ecosystem services;**
- **minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;**
- **preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and**
- **remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.**

4.2.67 Paragraph 111 requires that decisions on development proposals should be based on the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value.

4.2.68 Paragraph 118 of the NPPF requires that proposals conserve and enhance biodiversity by applying the following principles:

- **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;**
- **proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;**
- **development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;**

- **opportunities to incorporate biodiversity in and around developments should be encouraged;**

- **planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and**

- **the following wildlife sites should be given the same protection as European sites: – potential Special Protection Areas and possible Special Areas of Conservation;**

  – listed or proposed Ramsar sites; and

  – sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

4.2.69 The NPPF explains that to prevent unacceptable risks from pollution and land instability, new development should be appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, need to be considered. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

4.2.70 Paragraph 121 of the NPPF requires that the development site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation.

4.2.71 It should be established whether the development is an acceptable use of the land and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes.

4.2.72 NPPF paragraph 123 explains that planning decisions should aim to:

- **avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;**

- **mitigate and reduce to a minimum other adverse impacts27 on health and quality of life arising from noise from new development, including through the use of conditions;**

- **recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and**

- **identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.**

4.2.73 The NPPF describes that planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.

4.2.74 The encouragement of good design is considered a means to limit light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Conserving and Enhancing the Historic Environment

4.2.75 The NPPF outlines that in the determination of applications, the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation; the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and the desirability of new development making a positive contribution to local character and distinctiveness, all need to be accounted for.

4.2.76 NPPF paragraph 132 states that great weight should be given to the heritage asset's conservation when considering the impact of a proposed development. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting; any harm or loss should require clear and convincing justification. Substantial harm to or loss of a grade II listed building, park or garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, should be wholly exceptional.

4.2.77 NPPF paragraphs 133 and 134 states that:

> **(Paragraph 133) "Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, consent should be refused, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:**
>
> - **the nature of the heritage asset prevents all reasonable uses of the site; and**
> - **no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and**
> - **conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and**
> - **the harm or loss is outweighed by the benefit of bringing the site back into use."**
>
> **(Paragraph 134) "Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use. "**

4.2.78 The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application, with a balanced judgement being made based on the scale of any harm or loss and the significance of the heritage asset. Development should not result in the loss of the whole or part of a heritage asset without all reasonable steps being taken to ensure the new development will proceed after the loss has occurred.

4.2.79 NPPF paragraph 140 makes it clear that an assessment should be made to establish whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

4.2.80 The NPPF Technical Guidance was archived on 7 March 2013 and replaced by the new planning practice guidance launched on 6 March 2014, referred to at paragraph 4.2.1 and 4.2.2.

4.3 National Aviation Policy

Aviation Strategy White Paper (expected 2018)

4.3.1 The Government has announced that the Department for Transport (DfT) is currently progressing work to develop a new strategy for UK aviation (Written Statement to Parliament on Airport Capacity and Airspace Policy – 2 February 2017). The Government is aiming to publish the Aviation Strategy White Paper in 2018.

4.3.2 The Government has published a call for evidence consultation document to establish views on the approach the Government is proposing to take on a number of aviation issues identified to inform the Aviation Strategy. The consultation document is *entitled 'Beyond the Horizon: The Future of Aviation in the UK'* (July 2017). The new strategy is proposed to focus on aviation covering the whole country and for a long term strategy; with the consultation process examining the effect on all of the UK's regions. The expectation is that the White Paper will sit alongside the Airports NPS and that together, they will constitute the Government's new aviation policy and framework.

4.3.3 The strategy is proposed to focus on aviation covering the whole country and for a long term strategy; with the consultation process examining the effect on all of the UK's regions. It is stated that the aim of the Aviation Strategy is:

> **"To achieve a safe, secure and sustainable aviation sector that meets the needs of consumers and of a global, outward-looking Britain."**

4.3.4 It is recognised within the consultation document that before a new runway is built, for the UK to grow its domestic and international capacity, there is a need for existing runways throughout the UK to be more intensively utilised. The government also recognises that airports across the UK make a vital contribution to the health of the whole country. Of particular interest is part of paragraph 7.20:

> **"The government agrees with the Airports Commission's recommendation that there is a requirement for more intensive use of existing airport capacity and is minded to be supportive of all airports who wish to make best use of their existing runways including those in the South East."**

4.3.5 The consultation document outlines the importance of aviation supporting the UK's manufacturing and service sectors throughout the world. Aviation has a key role to play in achieving the Government's ambitions to increase productivity and grow the economy. As part of its objective to support sustainable economic growth, the government will look at how best to encourage regional connectivity to ensure these opportunities are open to the whole of the UK.

4.3.6 The Government received 372 responses to its consultation. In April 2018, it published a document entitled 'Beyond the Horizon: The Future of Aviation in the UK – Next steps towards an Aviation Strategy"[1] which sets out how the Government will take account of the responses to the call for evidence through the next phase of development of the Aviation Strategy. Paragraph 1.2 states that the new Aviation Strategy will take a fresh look at the aviation sector and its challenges and opportunities, as well as the role of Government. It will build on the UK's aviation success story in pursuit of the following aim:

[1] HM Government (2018) Beyond the Horizon: The Future of Aviation in the UK – Next steps towards an Aviation Strategy. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/698247/next-steps-towards-an-aviation-strategy.pdf [Accessed 05/07/18]

> **"To achieve a safe, secure and sustainable aviation sector that meets the needs of consumers and of a global, outward-looking Britain."**

4.3.7 The strategy will have the following six objectives (paragraph 1.4):

- help the aviation industry work for its customers;
- ensure a safe and secure way to travel;
- build a global and connected Britain;
- encourage competitive markets;
- support growth while tackling environmental impacts; and
- develop innovation, technology and skills.

4.3.8 Paragraph 8.1 of the document confirms the next steps for the aviation strategy. It states that a new simpler process will see a single green paper produced in Autumn 2018. There will now be an intense period of engagement and policy development that will inform the contents of the green paper that will ensure that the Government is able publish a comprehensive and fully informed Aviation Strategy in early 2019.

4.3.9 In June 2018, the Government reported on the feedback received from the Aviation Strategy call for evidence document, specifically on its proposal to support airports throughout the UK by making best use of their existing runways. "Beyond the Horizon: The Future of Aviation in the UK – Making best use of existing runways"[2] reported that 60% of the relevant responses were in favour of the Government's proposal, 17% against and 23% supportive provided certain issues were addressed (paragraph 1.7). Paragraph 1.26 states the Government's expectation for airports wishing to increase either their passenger or air traffic movement caps to allow them to make best use of their existing runways to submit applications to the relevant planning authority. Paragraph 1.27 states that applications to increase caps by 10mppa or more or deemed nationally significant would be considered as NSIPs under the Planning Act 2008 and would be considered by the Secretary of State. The Government makes clear (paragraph 1.26) that as part of any planning application, airports will need to demonstrate how they will mitigate against local environmental issues, taking account of relevant national policies, including any new environmental policies emerging from the Aviation Strategy. Paragraph 1.29 therefore concludes that:

"Therefore the Government is supportive of airports beyond Heathrow making best use of their existing runways. However, we recognize that the development of airports can have negative as well as positive local impacts, including on noise levels. We therefore consider that any proposals should be judged by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts and proposed mitigations."

Airports National Policy Statement (NPS): New Runway Capacity and Infrastructure at Airports in the South East of England (June 2018)

4.3.10 On 25th June 2018, the House of Commons debated the proposed Airports National Policy Statement that had been laid before Parliament on 5th June 2018[3]. Following approval from the House, the Airports NPS was designated as a national policy statement under the provisions of Section 5 (1) of the Planning Act 2008 subject to any legal challenge.

4.3.11 The Draft Airports NPS: "New runway capacity and infrastructure at airports in the South East of England" was published for consultation 24 October 2017, following an earlier version that was published on 2 February 2017, together with other supporting documents and analyses, including

[2] HM Government (2018) Beyond the Horizon: The Future of Aviation in the UK – Making best use of existing runways https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714069/making-best-use-of-existing-runways.pdf

[3] DfT (2018) Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England https://www.gov.uk/government/publications/airports-national-policy-statement

the draft Appraisal of Sustainability. This followed the outcome of the work by the Airports Commission which published its final report in July 2015 and the Government's announcement on 25 October 2016 that a new Northwest Runway at Heathrow Airport was its preferred scheme to deliver additional airport capacity in the South East of England.

4.3.12 The purpose of the NPS is to provide the primary basis of decision making on development consent applications for a Northwest Runway at Heathrow Airport[4]. It states in the clearest terms that '*the Airports NPS does not have effect in relation to an application for development consent for an airport development not comprised in an application relating to the Heathrow Northwest Runway….'*[5]. Thus, other than for the preferred scheme at Heathrow, the Airports NPS will not form the basis for determination of DCO applications as set out at Section 104(3) of the 2008 Planning Act.

4.3.13 The Airports NPS is still important and relevant for other applications for airports infrastructure in London and the South East of England (paragraph 1.41). Its policies will be important and relevant for the Examining Authority and Secretary of State[6] in examining and determining DCO applications such as that proposed that for Manston Airport but it is not the primary basis of determination in the same way as it is for the Heathrow Northwest Runway[7].

4.3.14 The Airports NPS also does not affect wider aviation issues *'for which the 2013 Aviation Policy Framework and any subsequent policy statements still apply'*[8]. Although service provided by Heathrow for freight is mentioned in the NPS, freight aviation would be considered a '*wider aviation issue'*.

4.3.15 The parts of the Airports NPS that are considered to be relevant to RiverOak's DCO application for Manston Airport are set out below.

4.3.16 Paragraph 1.1 of the NPS confirms that the UK aviation sector plays an important role in the modern economy, contributing around £20 billion per year and directly supporting approximately 230,000 jobs. It further recognises that the positive impacts of the aviation sector extend beyond its direct contribution to the economy by also enabling activity in other important sectors like business services, financial services, and the creative industries. The UK has the third largest aviation network in the world, and London's airports serve more routes than the airports of any other European city.

4.3.17 However, Paragraph 1.2 of the NPS fully recognises that London and the South East are now facing longer term capacity problems. Heathrow Airport is operating at capacity today, Gatwick Airport is operating at capacity at peak times, and the whole London airports system is forecast to be full by the mid-2030s. The NPS appreciates that there is still spare capacity elsewhere in the South East for point to point and especially low cost flights. However, with very limited capability at London's major airports, London is beginning to find that new routes to important long haul destinations are being set up elsewhere in Europe and this is having an adverse impact on the UK economy, and affecting the country's global competitiveness.

4.3.18 On 25th October 2016, the Government announced that a Northwest Runway at Heathrow Airport, combined with a significant package of supporting measures, was the Government's preferred scheme to deliver additional airport capacity in the South East of England. It also confirmed that this would be included in a draft Airports NPS, to be the subject of consultation according to the procedures laid down in the Planning Act 2008 (paragraph 1.10). The draft Airports NPS was published on 2nd February 2017. On publishing the draft Airports NPS, the Government made a commitment to continue updating its evidence base on airport capacity, including revised passenger demand forecasts and the impact of the publication of the final Air Quality Plan (the UK plan for tackling roadside nitrogen dioxide concentrations). In order to provide clarity, the Government revised the draft Airports NPS and some of the other documents which were

[4] Paragraph 1.12.
[5] Paragraph 1.41.
[6] Paragraph 1.14.
[7] The need to have regard to other matters which are both important and relevant to the determination of DCO applications is confirmed at Section 104(2)(d) of the Act.
[8] Paragraph 1.38.

published alongside it, on the basis of these changes to the evidence base and as a result of initial consideration of the responses to the February consultation and other broader government policy changes which have arisen during this period.

4.3.19 The Airports NPS sets out (paragraph 1.13):

- The Government's policy on the need for new airport capacity in the South East of England;
- The Government's preferred location and scheme to deliver new capacity; and
- Particular considerations relevant to a development consent application to which the Airports NPS relates.

4.3.20 The NPS recognises that it is imperative that the UK continues to grow its domestic and international connectivity until the expansion of Heathrow is complete, which it considered to be the more intensive use of existing airports other than Heathrow and Gatwick (paragraph 1.6).

4.3.21 The NPS reaffirms that international connectivity is important to the success of the UK economy as it facilitates trade in goods and services and is particularly important for many of the fastest growing sectors of the economy (paragraph 2.1). The NPS recognises that airports are the primary gateway for vital time-sensitive freight services (paragraph 2.2) and that the aviation sector benefits the UK economy through its direct contribution to GDP and employment, and by facilitating trade and investment, manufacturing supply chains, skills development, and tourism (paragraph 2.3).

4.3.22 Paragraphs 2.7 and 3.23 refer to the importance of freight services specifically:

> **"2.7 – Air freight is also important to the UK economy. Although only a small proportion of UK trade by weight is carried by air, it is particularly important for supporting export-led growth in sectors where goods are of high value or time critical. Heathrow Airport is the UK's biggest freight port by value. Over £178 billion of air freight was sent between UK and non-European Union countries in 2016, representing over 45% of the UK's extra-European Union trade by value. This is especially important in the advanced manufacturing sector, where air freight is a key element of the time-critical supply chain. By 2030, advanced manufacturing industries such as pharmaceuticals or chemicals, whose components and products are predominately moved by air, are expected to be among the top five UK export markets by their share of value. In the future, UK manufacturing competitiveness and a successful and diverse UK economy will drive the need for quicker air freight.**
>
> **3.23 - The aviation sector can also boost the wider economy by providing more opportunities for trade through air freight. The time-sensitive air freight industry, and those industries that use air freight, benefit from greater quantity and frequency of services, especially long haul. By providing more space for cargo, lowering costs, and by the greater frequency of services, this should in turn provide a boost to trade and GDP benefits."**

4.3.23 The benefits for freight delivered by the Heathrow Northwest Runway was one of four strategic considerations to which the Government afforded particular weight in selecting it as its preferred scheme[9]. It is considered, therefore, that these benefits should also be a strategic consideration of national importance when considering the merits of other airports schemes such as RiverOak's proposal at Manston which will also benefit freight services significantly.

Airports Commission Final Report (July 2015)

4.3.24 The independent Airports Commission was set up in late 2012 with a brief to find an effective and deliverable solution to increase aviation capacity in the South East as well as supporting the UK,

[9] Paragraph 3.73.

and to make recommendations which will allow the UK to maintain its position as Europe's most important aviation hub.

4.3.25 The Airports Commission short-listed three options for this new capacity: one new northwest runway at Heathrow Airport; a westerly extension of the northern runway at Heathrow Airport; and one new runway at Gatwick Airport. It conducted a robust, integrated and transparent process to assess these options, considering a range of economic, social and environmental factors and engaging extensively with interested parties through formal consultation, public evidence sessions and a programme of meetings and visits.

4.3.26 Each of the three schemes shortlisted was considered a credible option for expansion, capable of delivering valuable enhancements to the UK's aviation capacity and connectivity. Each would also have environmental impacts, which would need to be carefully managed.

4.3.27 The Commission concluded that the proposal for a new Northwest Runway at Heathrow Airport, in combination with a significant package of measures to address its environmental and community impacts presented the strongest case.

4.3.28 Relevant to Manston Airport, the report outlines that the strong growth in regional airport traffic became less uniform towards the end of the 2000s and since 2007. The UK's larger regional airports continued to grow their passenger numbers and route networks, whilst the small and medium sized regional airports have seen them plateau or decline.

4.3.29 Specifically, relevant to Manston Airport, the Commission throughout their considerations recognised that the air freight sector plays an important role in the UK economy and particularly to trade with emerging markets and other non-EU countries, and to many airlines. The Commission identified that the key sectors for air freight include perishables such as food and flowers and pharmaceutical products and medicines that need to be delivered in controlled environments within short shelf lives, as well as fast evolving high-tech products where several weeks of sea transit from the Far East might represent a significant proportion of the product's sales life.

Airports Commission Discussion Paper 06: Utilisation of the UK's Existing Airport Capacity (June 2014)

4.3.30 The Airports Commission during its investigation looked at the potential to redistribute demand away from London and south-east airports. The study suggested that there is relatively little scope for redistribution, but did recognise that regional airports and those serving London and the South East, other than Gatwick and Heathrow, play a crucial national role, especially at a time when the major London airports are operating very close to capacity.

Airports Commission Interim Report (December 2013)

4.3.31 Further in relation to Manston Airport, the Airports Commission Interim Report (December 2013) in Appendix 2: *Assessment of Long-Term Options*, is supportive of Manston Airport recognising that it:

> **"...presents some potential as a reliever airport, but does not address the larger question of London & South East capacity. The concept of reliever airports is considered in short and medium-term work. Please see Appendix 1 for further information."**

4.3.32 Appendix 1: *Assessment of Short- and Medium-Term Options* of the Interim Report - Section 3 '*Proposals received and Commission conclusion'* – table entry number 82 sets out the Commission's view of reliever airports. It defines the reliever airports concept as providing:

> **"support and/or financial incentives to encourage the growth of airports providing dedicated support for the business and general aviation markets with the potential additional benefit of reducing the use of congested airports for this traffic."**

4.3.33 It goes on to state that:

> **"The Commission is supportive of the reliever airports concept. The Commission recognises that this may be the best way to cater for the needs of business users without disrupting the wider airport system..."**

Aviation Policy Framework (March 2013)

4.3.34 This Aviation Policy Framework (APF) has fully replaced the 2003 Air Transport White Paper as Government's policy on aviation, alongside any decision the Government makes following the recommendation of the independent Airports Commission, and is therefore silent on specific policies either in support of or against further airport expansion in the South East. The Airports Commission was established in September 2012 with the remit of recommending how the UK can maintain its status as a global aviation hub and maintain our excellent international connectivity for generations to come, as well as making best use of our existing capacity in the shorter term.

4.3.35 In the absence of any specific commentary on regional airport expansion in the South East or Manston Airport itself, the APF does state that the Government recognises the very important role airports across the UK play in providing domestic and international connections and the vital contribution they can make to the growth of regional economies. It is acknowledged that for more remote parts of the UK, aviation is not a luxury, but provides vital connectivity. It states that many airports act as focal points for business development and employment by providing rapid delivery of products by air and convenient access to international markets and cites the success of East Midlands Airport which acts as a hub for freight.

4.3.36 In terms of air freight, the APF recognises its importance for supporting export-led growth in sectors where the goods are of high value or time critical. It goes on to state that air freight is a key element of the supply chain in the advanced manufacturing sector in which the UK is looking to build competitive strength. Goods worth £116 billion are shipped by air between the UK and non-EU countries, representing 35% of the UK's extra-EU trade by value. The express air freight sector alone contributed £2.3 billion to UK GDP in 2010, and facilitates £11 billion of UK exports a year. Over 38,000 people are directly employed in the express industry, which supports more than 43,000 jobs in other sectors of the economy. The APF further states that a successful and diverse economy will drive a need for quicker air freight. Key components to keep factories working are often brought in from specialist companies in North America and the Far East. To keep production lines rolling this often has to be done at short notice. Access to such services is crucial to keeping UK manufacturing competitive in the global marketplace.

4.3.37 The Aviation Policy Framework sets out Government's high-level objectives and policy on aviation. As a framework, it brings together many related and discrete policies and work streams, some of which are 'in train' – for example, the work being carried out to deliver the Airports NPS.

4.3.38 The APF sets out the role of the planning system in the operation of small and medium-sized aerodromes. It states that the underlying planning principles in respect of airfields remain unaltered in the NPPF which states that (Paragraph 1.90):

> **"When planning for ports, airports and airfields that are not subject to a separate national policy statement, plans should take account of their growth and role in serving business, leisure, training and emergency service need. Plans should take account of this framework as well as the principles set out in the relevant national policy statements and the Government Framework for UK Aviation."**

4.3.39 By defining Government's objectives and policies on the impacts of aviation, the APF sets out the framework within which decisions on aviation ought to be made to deliver a balanced approach to securing the benefits of aviation and to support economic growth. The main objectives of the APF are summarised below:

1. **Support growth and the benefits of aviation** - to achieve long-term economic growth recognising that the aviation sector is a major contributor to the economy whose growth the Government supports; and to ensure that the UK's air links continue to make it one of the best-connected countries in the world. This includes increasing our links to emerging markets so that the UK can compete successfully for economic growth opportunities.

   - Aviation's contribution to the UK economy;

     Paragraph 1.1 recognises that with the increasing globalisation of our economy and society, the future of the UK will undoubtedly continue to be shaped by the effectiveness of its international transport networks.

     Paragraph 1.2 recognises that aviation infrastructure plays an important role in contributing to economic growth through the connectivity it helps deliver, for example, by providing better access to markets, enhancing communications and business interactions, facilitating trade and investment and improving business efficiency through time savings, reduced costs and improved reliability for business travellers and air freight operations.

     Paragraph 1.3 confirms that there is broad agreement that aviation benefits the UK economy, both at a national and a regional level and that the economic benefits are significant, particularly those benefits resulting from the connectivity provided by aviation. Additionally, paragraph 1.3 states that there are social and cultural benefits from aviation.

     Gross domestic product and jobs – paragraph 1.4 recognises that the air transport sector's turnover is around £28 billion, and the sector directly generates around £10 billion of economic output. It provides about 120,000 jobs in the UK and supports many more indirectly. Paragraph 1.5 rightly recognises that the economic importance of the aviation sector extends beyond its direct contribution to UK Gross Domestic Product (GDP) and employment, as an enabler of activity in many other sectors of the economy.

     Imports and Exports - paragraph 1.6 recognises that although air freight carries a small proportion of UK trade by weight, it is particularly important for supporting export-led growth in sectors where the goods are of high value or time critical. Paragraph 1.7 states that the express air freight sector alone contributed £2.3 billion to UK GDP in 2010, and facilitates £11 billion of UK exports a year. Over 38,000 people are directly employed in the express industry, which supports more than 43,000 jobs in other sectors of the economy. Paragraph 1.8 recognises that a successful and diverse economy will drive a need for quicker air freight and that access to such services is crucial to keeping UK manufacturing competitive in the global marketplace.

     Manufacturing, skills and technology – paragraph 1.9 recognises that the UK has the second largest aerospace manufacturing industry in the world and the largest in Europe and that the growth prospects for the UK industry are sizeable based on global traffic growth predictions (£352 billion revenue up to 2030). Paragraph 1.11 recognises that new and emerging technologies, such as unmanned aerial vehicles (UAVs), offer significant opportunities in the civil aviation field, for example in oil, and mineral exploration, air freight, search and rescue, data gathering and scientific research, as well as opportunities for technology transfer to the wider aviation sector.

Value of business and general aviation – paragraph 1.12 recognises that business and general aviation (GA) is important to the UK and that its contribution to the economy has been estimated at £1.4 billion per annum. The sector covers a wide range of activities. A Civil Aviation Authority (CAA)-initiated and chaired strategic review of the sector has acknowledged its growing economic importance, particularly for the British and European manufacturing industry.

Greater productivity and growth – paragraph 1.13 confirms that the UK's aviation sector enables productivity and growth in the following ways:

- enhanced access to markets and new business opportunities through improved connectivity;
- lower transport costs and quicker deliveries. For example, transporting freight by air allows smaller inventory holdings, and the rapid transport of perishable goods leads to increased specialisation of production which results in greater efficacies; and
- facilitating inward investment and the movement of goods, people and ideas both within the UK and to and from the rest of the world thus enhancing trade and the diffusion of knowledge and innovation.

Some of the main benefits to consumers and businesses from greater investment and effective use of airport infrastructure include (paragraph 1.14):

- reductions in delays and disruption as a result of airport congestion, which affect airlines, passengers and the wider community; and
- increased frequency and range of flights to faster-growing economies.

Tourism – paragraph 1.15 confirms that air travel is essential to the Government Tourism Policy. Good connectivity from the UK to emerging economies is likely to increase the scope for growth in inbound tourism in future. Earnings from overseas visits were £18 billion, 84% of which was spent by people who arrived by air. Paragraph 1.16 states that the Government believes that the chance to fly abroad also offers quality of life benefits including educational and skills development. Overall, continuing to make UK tourism more attractive is deemed to be a better approach both for residents and attracting new visitors.

Travel, culture and family - in addition to its economic contribution, aviation provides wider social benefits, enabling UK citizens to experience different cultures or enjoy a well-earned holiday (paragraph 1.17). In an increasingly globalised society visiting friends and relatives is an increasingly important reason for flying. Visiting friends and relatives also forms a significant proportion of business for airports outside London and the South East, which in some cases helps maintains the viability of their air links.

- Supporting airports across the UK;

The APF recognises the growth and importance of airports outside London in achieving the Government's aim of helping the economy to grow by encouraging investment and exports as a route to a more balanced economy.

Paragraph 1.20 recognises that airports create local jobs and fuel opportunities for economic rebalancing in their wider region or area. New or more frequent international connections attract business activity, boosting the economy of the region and providing new opportunities and better access to new markets for existing businesses.

Paragraph 1.21 especially recognises the very important role airports across the UK play in providing domestic and international connections and the vital contribution they can make to the growth of regional economies.

Paragraph 1.22 acknowledges that airports act as focal points for business development and employment by providing rapid delivery of products by air and convenient access to international markets.

Paragraph 1.23 recognises that airports outside the South East of England also have an important role in helping to accommodate wider forecast growth in demand for aviation in the UK, which could help take some pressure off London's main airports. The availability of direct air services locally from these airports can also reduce the need for air passengers and freight to travel long distances to reach larger UK airports.

- Connectivity;

  Paragraph 1.36 repeats earlier messages that aviation significantly benefits the UK because it provides the UK with excellent access to the rest of the world and brings people closer together within the UK. With the increasing globalisation of the economy and society, the APF recognises that the future of the UK will undoubtedly continue to be shaped by the effectiveness of its international transport networks.

  Paragraph 1.46 recognises that the UK's continued economic success depends on being able to connect with the countries and locations that are of most benefit to the UK economy. This is important in relation both to destinations that fall into that category today and those locations that will become crucial to the country's economic success in the future. While it remains vital for the UK to maintain its connectivity with established markets such as the USA and in Europe, it is also important that advantage is taken of the growing opportunities presented in the emerging economies of the world to remain competitive in the global economy.

- Aviation demand forecasts;

  Paragraph 1.54 accepts that in the most likely scenarios, the major South East airports are forecast to be full by 2030. However, other scenarios have this occurring as soon as 2025 or as late as 2040, depending primarily on the rate of economic growth and the price of oil. In paragraph 1.55, the APF states that according to the most likely scenarios, a number of non-London airports, including Birmingham, Bristol, East Midlands and Manchester Airport, are also assessed as reaching capacity over a similar time scale. In paragraph 1.56, it is acknowledged that Heathrow had effectively reached its maximum capacity in 2011 and it is forecast to remain at full capacity across all the demand cases considered.

- Strategy for a vibrant aviation sector: the short term; and

In the short term (to around 2020) the Government's key priority as set out in the APF is to continue to work with the aviation industry and other stakeholders to make better use of existing runways at all UK airports. The Government's strategy is to focus on making best use of existing capacity to improve performance, resilience and the passenger experience; encourage new routes and services; support airports outside the South East to grow and develop new routes; and better integrate airports into the wider transport network (paragraph 1.60). Additionally, the Government recognises the importance of maintaining access to a national network of aerodromes including regional aerodromes in England which it says is vital to the continuing success of the aviation sector (paragraph 1.86).

- Strategy for a vibrant aviation sector: the medium and long term.

  This is based in part on integrating airports in the wider transport network and especially, through considering options for enhancing rail services to major airports (paragraph 1.99). This includes developing a national high rail network (paragraph 1.100) where it is stated that the Government will ensure that its national strategies for aviation and high-speed rail are aligned, providing a better travel offer to the UK travelling public.

2. **Managing aviation's environmental impacts**

The Government's objective is to ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions (paragraph 2.4). The emphasis is on action at a global level as the best means of securing our objective, with action within Europe the next best option and a potential step towards wider international agreement (paragraph 2.5). At a national level, the Government states that it will also take unilateral action where that is appropriate and justified in terms of the balance between benefits and costs.

The Government's policy approach to environmental effects and mitigation demonstrates that it expects environmental effects to arise from the developments that it supports. However, it does not anticipate that such effects would, in principle, represent obstacles to the grant of planning permission. Rather the policy indicates that local controls (and local policies) are to be applied to control, mitigate or compensate for the environmental effects.

Paragraph 2.60 confirms that the Government strongly supports the need to better understand and manage the risks associated with climate change because it is essential for the successful long-term resilience of the UK's aviation industry and its contribution to supporting economic growth and competitiveness.

3. **Noise and other local environmental impacts**

Paragraph 3.1 fully recognises that whilst the aviation industry brings significant benefits to the UK economy, there are costs associated with its local environmental impacts which are borne by those living around airports, some of whom may not use the airport or directly benefit from its operations – and that these include noise, air quality and other local environmental impacts.

Noise - The Government's overall policy on aviation noise is to limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise, as part of a policy of sharing benefits of noise reduction with industry (paragraph 3.12).

The Government will continue to ensure that noise exposure maps are produced for the noise-designated airports on an annual basis providing results down to a level of 57dB LAeq 16 hour (paragraph 3.15) and to improve monitoring of the specific impact of night noise, separate night noise contours for the eight-hour night period (11pm–7am) are to be produced for the designated airports. Paragraph 3.17 confirms that the Government will continue to treat the 57dB LAeq 16 hour contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance. However, it is recognised that this does not mean that all people within this contour will experience significant adverse effects from aircraft noise, nor does it mean that no-one outside of this contour will consider themselves annoyed by aircraft noise.

Paragraph 3.24 fully accepts that the acceptability of any growth in aviation depends to a large extent on the industry tackling its noise impact. As a general principle, the Government expects that at the local level, individual airports working with the appropriate air traffic service providers should give particular weight to the management and mitigation of noise, as opposed to other environmental impacts, in the immediate vicinity of airports (paragraph 3.25). In paragraph 3.26, the Government states its wish for airports to consider using the powers available to them to set suitable noise controls such as departure noise limits, minimum height requirements, noise-preferential routes and adherence to continuous descent approach, and where appropriate to enforce these with dissuasive and proportionate penalties and that both controls and the levels of penalties should be reviewed regularly in consultation with local communities and consultative committees, to ensure they remain effective.

In terms of night noise, the Government recognises that the costs on local communities are higher from aircraft noise during the night, particularly the health costs associated with sleep disturbance (paragraph 3.34). Noise from aircraft at night is therefore widely regarded as the least acceptable aspect of aircraft operations. However, the Government also recognises the importance to the UK economy of certain types of flights, such as express freight services, which may only be viable if they operate at night. In paragraph 3.35, the Government sets out its expectation that the aviation industry should make extra efforts to reduce and mitigate noise from night flights through use of best-in-class aircraft, best practice operating procedures, seeking ways to provide respite wherever possible and minimising the demand for night flights where alternatives are available.

Noise insulation and compensation – in paragraph 3.36, the Government states that it continues to expect airport operators to offer households exposed to levels of noise of 69 dB LAeq,16h or more, assistance with the costs of moving. The Government also expects airport operators to offer acoustic insulation to noise-sensitive buildings, such as schools and hospitals, exposed to levels of noise of 63 dB LAeq,16h or more. Where acoustic insulation cannot provide an appropriate or cost-effective solution, alternative mitigation measures should be offered (paragraph 3.37). If no such schemes already exist, airport operators should consider financial assistance towards acoustic insulation for households (paragraph 3.38).

Air quality and other local environmental impacts – paragraph 3.46 acknowledges that airports have a significant impact on other aspects of the local environment including emissions from transport contributing to air pollution. The Government's policy on air quality is to seek improved international standards to reduce emissions from aircraft and vehicles and to work with airports and local authorities as appropriate to improve air quality, including encouraging HGV, bus and taxi operators to replace or retrofit with pollution-reducing technology older, more polluting vehicles (paragraph 3.48).

Loss of protected habitats, protected species, protected landscape and built heritage, and significant impacts on water resources and ecosystems would only be advocated if there were no feasible alternatives and the benefits of proposals clearly outweighed those impacts (paragraph 3.55). Any unavoidable impacts would be mitigated or compensated for. The Government's policy is to ensure there is full consideration of the environmental impacts of the most credible options for maintaining our international connectivity.

4. **Working together -** to encourage the aviation industry and local stakeholders to strengthen and streamline the way in which they work together.

4.3.40 There are other important high-level policy objectives. Although they are not the subject of the APF, they support and are consistent with it and are being taken forward separately. These objectives include protecting passenger rights, competition and regulation policy, airspace, safety and security.

4.3.41 Section 5 concerns **Planning** and explains the APF's status and its interaction with existing planning guidance and policies and any decisions following the recommendations of the Airports Commission. It applies to the whole of the UK.

4.3.42 Paragraph 5.5 states that should the Government decide to support any new nationally significant airport infrastructure following the conclusions of the Airports Commission's work, it is likely that the next step would be to draft and consult on a National Policy Statement (NPS) for Airports which would accelerate the resolution of any future planning application(s). The Government published its draft Airports NPS in February 2017 (see below for further details). The Airports NPS was designated as a national policy statement in June 2018.

4.3.43 In terms of planning policies, paragraph 5.6 states that in preparing their local plans, local authorities are required to have regard to policies and advice issued by the Secretary of State. This includes the APF, to the extent it is relevant to a particular local authority area, along with other relevant planning policy and guidance. The APF may be a material consideration in planning decisions depending on the circumstances of a particular application.

4.3.44 In terms of safeguarding, paragraph 5.8 states that the NPPF makes clear that local planning authorities should 'identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen choice' and that this could apply to airport infrastructure. Paragraph 5.9 relates to land outside existing airports that may be required for airport development in the future and how this needs to be protected against incompatible development until the Government has established any relevant policies and proposals in response to the findings of the Airports Commission.

4.3.45 Paragraph 5.11 states that all proposals for airport development must be accompanied by clear surface access proposals which demonstrate how the airport will ensure easy and reliable access for passengers, increase the use of public transport by passengers to access the airport, and minimise congestion and other local impacts.

4.3.46 Paragraphs 5.14 and 5.15 relate to Public Safety Zones (PSZs) which are areas where accidents are most likely to occur. The objective is to control the number of people at risk through the PSZ system. PSZs are areas of land at the ends of runways at the busiest airports, within which development is restricted. The Government's basic policy objective remains not to increase the number of people living, working or congregating in PSZs and, over time, to see the number reduced. Where necessary, the Government expects airport operators to offer to buy property which lies wholly or partly within those parts of the zones where the risk is greatest. The Government's objective is to continue to protect those living near airports by maintaining and, where justified, extending the PSZ system. The expectation is that PSZs will not be needed at Manston in line with previous arrangements.

4.3.47 The Government is in the process of replacing the APF with a more comprehensive 'Aviation Strategy.' This is expected in 2018.

4.4 Regional Policy

4.4.1 This section looks to summarise the regional policy that is relevant in the consideration of any future development at Manston Airport.

4.4.2 It should be noted that the strategic planning functions of County Councils that were prominent historically are now much reduced following the *Planning and Compulsory Purchase Act 2004*. As the County Planning Authority, Kent County Council (KCC) only has responsibility now for mineral and waste development. It is also the planning authority for the County Council's own development such as new roads and transportation schemes.

The London Plan, 2016 (Consolidated with Alterations since 2011)

4.4.3 Under legislation establishing the Greater London Authority (GLA), the London Mayor has to produce a 'Spatial Development Strategy', which is known as 'The London Plan'. The London Plan was first adopted in July 2011, and has since been updated in 2013 and most recently in 2016. It covers the strategic planning policies (economic, social, environmental and transport) for all 32 London Boroughs.

4.4.4 The London Plan does not set out to 'micro-manage' aspects that are better addressed by local boroughs, but it does contain numerous cross-cutting policies in achieving sustainable development, social inclusion and regeneration.

4.4.5 The London Plan recognises that despite being located outside of Greater London, regional airports provide a key contribution to supporting both the economy and connectivity of London.

4.4.6 With regards to Manston Airport, there are no specific policies contained in the London Plan, primarily because Manston Airport is not in London. However, paragraph 2.16 states that the Mayor will help coordinate the development and implementation of policies for corridors that have been identified as being of importance to London and the wider city region. The Thames Gateway is identified as the nearest development corridor (extending to within 35km of Manston Airport), covering a large area of Kent, though it does not quite extend to Manston Airport itself.

4.4.7 Within Chapter 6 of the London Plan (London's Transport) Policy 6.4 relates to improving London's transport connectivity. At a strategic level, the Mayor will support seeking improved access by public transport to airports.

4.4.8 With regard to aviation, there is a specific policy in the London Plan (Policy 6.6). It states that adequate airport capacity serving a wide range of destinations is critical to the competitive position of London in a global economy. Airport capacity serving the capital and wider south-east of England must be sufficient to sustain London's competitive position.

The Draft London Plan (2017)

4.4.9 A draft London Plan was published for consultation on the 29 November 2017.

4.4.10 With regards to Manston Airport, there are no specific policies contained in the Draft London Plan, primarily because Manston Airport is not in London.

4.4.11 Policy SD2 (Collaboration in the Wider South East) looks for strategic understanding of the transport issues facing the wider south east. It outlines that the Mayor will work with wider south-east partners to find solutions to shared strategic concerns including the wider needs for freight.

4.4.12 Policy T8 concerns aviation and states that the Mayor supports the case for additional aviation capacity in the South East of England provided it would meet London's passenger and freight needs recognising that this is crucial to London's continuing prosperity and to maintaining its international competitiveness and world-city status. Policy T8 sets out the Mayor's opposition to expansion of Heathrow Airport unless it can be shown that no additional noise or air quality harm would result, and that the benefits of future regulatory and technology improvements would be fairly shared with affected communities. Policy T8 further states that any changes to London's airspace must treat London's major airports equitably when airspace is allocated.

4.4.13 Policy T8 (Aviation) states that better use should be made of existing airport capacity, underpinned by upgraded passenger and freight facilities and improved surface access links, in particular rail.

4.4.14 Paragraph 10.8.4 states that the Mayor recognises the need for additional runway capacity in the south east of England, but this should not be at the expense of London's environment or the health of its residents.

4.4.15 In paragraph 10.8.10, the Mayor recognises that air freight plays an important role in supporting industry in London and the UK, and the provision of both belly hold and dedicated freighter capacity should be an important consideration when plans for airport development in the south east of England are taken forward.

4.5 Local Planning Policy

4.5.1 In this section, summaries of the relevant planning policies contained within the statutory Development Plans of the following Local Planning Authorities are provided:

- Thanet District Council (TDC);
- Dover District Council (DDC); and
- Canterbury City Council (CCC).

4.5.2 Reforms to the production of local planning policy were set out in the Planning and Compulsory Purchase Act (2004) with detailed guidance contained in Planning Policy Statement 12 (PPS12) – Local Spatial Planning. The *Planning and Compulsory Purchase Act (2004*) Schedule 8 sets out a period of three years for the transition of old policy to a new policy that replaces it (when it is published, adopted or approved). Where local authorities had not produced the required new policy, the Secretary of State for Communities and Local Government provided direction that the transition period as set out in the *Planning and Compulsory Purchase Act (2004*) would not apply, and in effect adopted planning policies would be in effect 'saved' until replacement planning policy was adopted.

4.5.3 For the purposes of decision-taking, saved Local Plan policies should not be considered out-of-date simply because they were adopted prior to the publication of the NPPF. However, from March 2013, due weight should be given to saved policies in existing plans according to their degree of consistency with the NPPF (the closer the policies in the plan to the policies in the NPPF, the greater the weight that may be given).

Thanet District Council

4.5.4 The Manston Airport site is located entirely within the administrative area of TDC.

4.5.5 The statutory Development Plan for TDC comprises:

- Thanet Local Plan (2006) (Saved Policies);
- Cliftonville Development Plan Document (February 2010);
- Local Plan Proposals Map; and
- Kent Waste and Minerals Local Plan (Saved Policies).

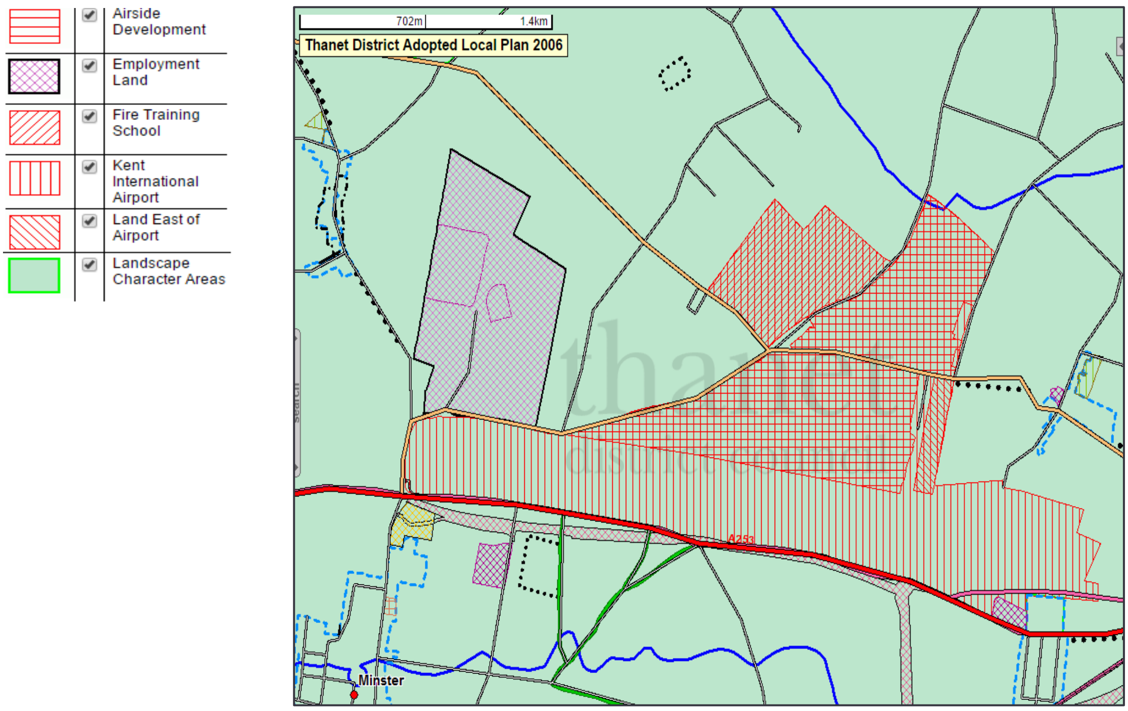
Thanet Local Plan Saved Policies and Proposals Map

4.5.6 An extract from the Local Plan Proposals Map showing the Manston Airport site is provided below in **Figure 4.1.1**.

4.5.7 The key planning policy designations that affect the Manston Airport site and the area adjoining it as shown on the Local Plan Proposals Map are as follows:

- The airport boundary is defined on the Proposals Map (Policy EC2 – Kent International Airport);
- Policy EC4 – Airside Development Area;
- Policy EP13 – Groundwater Protection Zone;
- Policy CC1 – Development in the Countryside;
- Policy CC2 – Central Chalk Plateau;
- The land to the east is designated for terminal related purposes (Policy EC5 – Land at, and east of the Airport Terminal); and
- The land to the west is designated for economic development (Policy EC1 – Manston Park, Manston).

Figure 4.1.1 Extract from TDC Local Plan (2006) Proposal Maps showing Manston Airport and relevant extract from the key



Land Designations

4.5.8 Saved **Policy EC2 (Kent International Airport)** refers to the boundary for the airport site as shown on the Proposals Map. Policy EC2 states that:

> **"Proposals that would support the development, expansion and diversification of Kent international airport will only be permitted subject to the following requirements:**
>
> **1. Demonstrable compliance with the terms of the**

current agreement under section 106 of the town and country planning act 1990 or subsequent equivalent legislation;

2. **New built development is to be designed to minimise visual impact on the open landscape of the central island. particular attention must be given to roofscape and to minimising the mass of the buildings at the skyline when viewed from the south;**
3. **Appropriate landscaping schemes, to be designed and implemented as an integral part of the development:**
4. **Any application for development for the purpose of increasing aircraft movements in the air or on the ground, auxiliary power or engine testing, must be supported by an assessment of the cumulative noise impact and the effectiveness of mitigation measures to be implemented in order to minimise pollution and disturbance. the acceptability of proposals will be judged in relation to any identified and cumulative noise impact, the effectiveness of mitigation and the social and economic benefits of the proposals;**
5. **An air quality assessment in compliance with policy ep5, to demonstrate that the development will not lead to a harmful deterioration in air quality. permission will not be given for development that would result in national air quality objectives being exceeded;**
6. **Development will not be permitted within the airport complex to the south of the airside development site identified in policy ec4, unless it has been demonstrated that the development is necessary for the purpose of air traffic management;**
7. **Any new development which would generate significant surface traffic must meet requirements for surface travel demand in compliance with policy ec3.**
8. **It must be demonstrated that new development cannot contaminate groundwater sources or that appropriate mitigation measures will be incorporated in the development to prevent contamination."**

4.5.9 Saved **Policy EC4 (Airside Development Area)** refers to land within the boundary of the airport site excluding the runway as shown on the Proposals Map. Policy EC4 states that:

> **"Land at the airport, as identified on the proposals map, is reserved for airside development. Development proposals will require specific justification to demonstrate that an airside location is essential to the development proposed. Development will be required to retain sufficient land to permit access by aircraft of up to 65m (217ft) wingspan to all parts of the site."**

4.5.10 The land north of the runway and including the land north of the B2050 Manston Road is safeguarded for airside development purposes. This is defined as uses with an operational requirement for direct access to aircraft and therefore dependent on a location immediately adjacent to the runway or capable of direct access to it via taxiways. This includes uses based on:

- Operation of passenger handling services;
- Air cargo operations related to the site;
- Operation of aircraft maintenance and manufacturing; and
- Services ancillary to the maintenance and operation of the airport.

4.5.11 Saved **Policy EP13 (Ground Water Protection Zones)** covers all land within and adjacent to the boundary of the airport site as shown on the Proposals Map. Policy EP13 states that:

> **"If a proposed development in the groundwater protection zones identified on the proposals map would have the potential to result in a risk of contamination of groundwater sources, it will not be permitted unless adequate mitigation measures can be incorporated to prevent such contamination taking place."**

4.5.12 The airport is entirely located in the countryside. Saved **Policy CC1** (Development in the Countryside) states that the Thanet Countryside is defined as those areas of the District outside the identified urban and village confines. Within the countryside, Policy CC1 states that new development will not be permitted unless there is a need for the development that overrides the need to protect the countryside.

4.5.13 Saved **Policy CC2 (Landscape Character Areas)** covers all land within and adjacent to the boundary of the airport site as shown on the Proposals Map. Policy CC2 states that:

> **"Within the landscape character areas identified on the proposals map, the following policy principles will be applied:**
> **On the central chalk plateau, a number of sites are identified for various development purposes. where development is permitted by other policies in this plan, particular care should be taken to avoid skyline intrusion and the loss or interruption of long views of the coast and the sea;**
> **Development proposals that conflict with the above principles will only be permitted where it can be demonstrated that they are essential for the economic or social well-being of the area.**
> **In the event of a real and specific threat to the landscape character of these areas from permitted development, the use of article 4 directions will be considered, and secretary of state approval for the direction sought."**

4.5.14 Saved **Policy EC5 (Land at, and East of, the Airport Terminal)** covers a relatively small parcel of land to the east of the terminal and north of the runway which is safeguarded for terminal operational requirements, as shown on the Proposals Map. Policy EC5 states that:

> **"Until such time as a new airport terminal is built, land at, and east of, the existing airport terminal is identified on the proposals map for airport terminal-related purposes. Uses will be restricted to those which directly support or complement the operational requirements of the existing airport terminal. Should a new terminal be built, other airport-related development will be permitted on this allocated site. Planning conditions or planning agreements will be applied to limit any development granted planning consent to uses conforming to this policy."**

4.5.15 The Local Plan (Saved Policies) recognises that some airport terminal-related activities need to be located adjacent to the existing terminal building. This could include, for example, car parking or the physical expansion of the terminal. In order to cater for such uses, this site is identified on the Proposals Map including the existing airport terminal facilities and land immediately to the east of the terminal. This site is also acknowledged to provide a reasonable gap between the terminal area and Manston Village.

4.5.16 Saved **Policy EC1 (Land Allocated for Economic Development)** covers the employment area west of the airport and north of the western extent of the runway, as shown on the Proposals Map. Policy EC1 states that:

> **"At the following sites, as shown on the proposals map, land is allocated for business purposes:**

4 Manston Park, Manston
Use will be restricted to classes B1 (business), B2 (general industry) and B8 (storage and distribution). on all sites a landscaping scheme appropriate to the scale, location and character of the site will be required to provide an attractive environment.

On these sites planning applications should be accompanied by traffic impact studies and green travel plans, unless the development is considered too small to have a significant travel impact."

Economic Development and Regeneration

4.5.17 In terms of economic development and regeneration, Chapter 2 of the Local Plan (Saved Policies) states that:

> **"The development of Kent International Airport as an important regional hub and business location, and its proximity to the business parks ensures a key role for the airport in the economic regeneration of the area."**

4.5.18 The Local Plan (Saved Policies) recognises the political decisions that need to be made regarding the major London airports and the subsequent effects this will have on regional airports such as Kent International Airport.

4.5.19 It is outlined that where there is higher investment by the owners of Manston Airport in improving handling facilities, better passenger facilities and new or improved terminals, it is more likely the airport will attract substantial growth by attracting aircraft operators.

4.5.20 Chapter 2 of the Local Plan (Saved Policies) highlights the operational importance of Kent International Airport due to the length of runway, together with the substantial areas of surrounding land available for employment purposes. The Council are clear in their support for the future development of Kent International Airport.

Housing

4.5.21 The expansion of activity at Kent International Airport is quoted as one of four main sources of employment growth that will result in additional housing requirements in the district.

Transport

4.5.22 The Local Plan (Saved Policies) outlines that TDC and adjoining District Councils wish to see Kent International Airport develop as a regional airport. It is acknowledged that the airport offers very significant economic and employment benefits for Thanet and East Kent. Its development will also have significant transport implications arising from passengers, freight and employees.

4.5.23 In addition to the airport itself, additional transport infrastructure works are also set out:

- Bus priority and cycle facilities on the A256 and from urban Thanet to Kent International Airport and the Central Island Business Parks; and
- Medium and long-term proposals for rail access to Kent International Airport

Environmental Protection

4.5.24 Policy EP5 (Local Air Quality Monitoring) states that:

> **"Proposals for new development that would result in the national air-quality objectives being exceeded will not be permitted.**

Development proposals that might lead to such an exceedance, or to a significant deterioration in local air quality resulting in unacceptable effects on human health, local amenity or the natural environment, will require the submission of an air quality assessment, which should address:

9. **the existing background levels of air quality;**
10. **the cumulative effect of further emissions;**
11. **the feasibility of any measures of mitigation that would prevent the national air quality objectives being exceeded, or would reduce the extent of air quality deterioration."**

4.5.25 Whilst the Council supports the development of Kent International Airport as a regional airport, Policy EP7 seeks to limit the effect of aircraft noise on sensitive development such as housing, schools and hospitals, by restricting locations where such development may be sited.

4.5.26 In 1995, the District Council commissioned production of aircraft noise contours by Arup showing predicted noise levels and based on a study of Kent International Airport Traffic Forecasts by Alan Stratford Associates. The forecasts considered a range of high, medium and low traffic scenarios, including the possibility of increased aviation associated with the prospective major economic regeneration role of Central Thanet, and possible runway extension.

4.5.27 At the time of preparing the Local Plan (Saved Policies) there was uncertainty regarding future aircraft noise levels at Kent International Airport. The Council was therefore adopting a precautionary approach in relation to aircraft noise, and for the purposes of Policy EP7, will continue to apply the 1996 (dBLAeq 16 hour) contour predictions, which formed the basis for the Policy in the adopted Local Plan, assuming the presence of military jets. The District Council advised they will review the need to consider adoption of alternative contour scenarios as circumstances develop, with quieter commercial aircraft entering service and civilian air activity increasing. Accordingly, because the contours may be subject to change within the Plan period, they are not featured on the Proposals Map.

4.5.28 Policy EP7 (Aircraft Noise) states that:

"Applications for noise sensitive development or redevelopment on sites likely to be affected by aircraft noise will be determined in relation to the latest accepted prediction of existing and foreseeable ground noise measurement of aircraft noise.
Applications for residential development will be determined in accordance with the following noise exposure categories:

NEC	PREDICTED AIRCRAFT NOISE LEVELS (Dbl Aeq.0700-23.00)	
A	<57	NOISE WILL NOT BE A DETERMINING FACTOR
B	57-63	NOISE WILL BE TAKEN INTO ACCOUNT IN DETERMINING APPLICATIONS, AND WHERE APPROPRIATE, CONDITIONS WILL BE IMPOSED TO ENSURE AN ADEQUATE LEVEL OF PROTECTION AGAINST NOISE (POLICY EP8 REFERS).
C	63-72	PLANNING PERMISSION WILL NOT BE GRANTED EXCEPT WHERE THE SITE LIES WITHIN THE CONFINES OF EXISTING SUBSTANTIALLY BUILT-UP AREA. WHERE RESIDENTIAL DEVELOPMENT IS EXCEPTIONALLY GRANTED, CONDITIONS WILL BE IMPOSED TO ENSURE AN ADEQUATE LEVEL OF PROTECTION AGAINST NOISE (POLICY EP8 REFERS).

D	>72	RESIDENTIAL DEVELOPMENT WILL NOT BE PERMITTED.

Applications for non-residential development including schools, hospitals and other uses considered sensitive to noise will not be permitted in areas expected to be subject to aircraft noise levels exceeding 60 dB(a) unless the applicant is able to demonstrate that no alternative site is available. Proposals will be expected to demonstrate adequate levels of sound insulation where appropriate in relation to the particular use."

Draft Thanet Local Plan to 2031 Preferred Options (January 2015)

4.5.29 Within the Draft Local Plan, Strategic Priority 1 looks to create additional employment and training opportunities, to strengthen and diversify the local economy and improve local earning power and employability. With regards to Manston Airport it states that:

"Support the sustainable development and regeneration of Manston Airport to enable it to function as a local regional airport, providing for significant new employment opportunities, other supporting development and improved surface access subject to environmental safeguards or as an opportunity site promoting mixed-use development that will deliver high quality employment and a quality environment."

4.5.30 The Council recognises that various options are available with regards to the future use of the Manston Airport site, as an airport operation and for aviation activities, as well as for other developments. It is acknowledged that these need to be explored and assessed for the wider area of the airport and its environ through the development plan making process. The Council are therefore seeking to designate the area as an "opportunity area" for which TDC will prepare Area Action Plan (AAP) Development Plan Document. The AAP for Manston Airport will set out the development framework for the development and regeneration of the area.

4.5.31 Policy SP05 (Manston Airport) states that:

"The site of Manston Airport and the adjoining area will be designated as an "Opportunity Area" for the purposes of preparing the Manston Airport Area Action Plan" Development Plan Document. The Manston Airport AAP will explore through the development plan process the future development options for the site of the airport and the adjoining area. A consideration of the AAP should be the retention, development and expansion of the airport and aviation operations where supported by a feasibility study and a viable Business Plan, while exploring alternative options for the future development of the area for mixed-use development.

While the Manston Airport Area Action Plan is being prepared and until adopted by the Council as a development plan for the Manston Airport area, the following policy for the Manston Airport will apply.

Proposals at the airport, that would support the development, expansion and diversification of Manston Airport, will be permitted subject to all of the following requirements.

1) That there be demonstrable compliance by the applicants with the terms of the current agreement under section 106 of the Town and Country Planning

Act 1990 as amended or subsequent equivalent legislation.

2) That new built development is to be designed to minimise visual impact on the open landscape of the central island. Particular attention must be given to roofscape for the purposes of minimising the mass of the buildings at the skyline when viewed from the south.

3) The provision of an appropriate landscaping scheme, to be designed and implemented as an integral part of the development.

4) That any application for development for the purpose of increasing aircraft movements in the air or on the ground, auxiliary power or engine testing, be supported by an assessment of cumulative noise impact and the effectiveness of mitigation measures to be implemented in order to minimise pollution and disturbance. The acceptability of proposals will be judged in relation to any identified and cumulative noise impact, the effectiveness of mitigation and the social and economic benefits of the proposals.

5) The provision of an air quality assessment in compliance with the Air Quality Management Plan to demonstrate that the development will not lead to a harmful deterioration in air quality. Permission will not be given for development that would result in national air quality objectives being exceeded.

6) That any new development which would generate significant surface traffic must meet requirements for surface travel demand.

7) That it must be demonstrated both that new development cannot contaminate groundwater sources and that appropriate mitigation measures will be incorporated in the development to prevent contamination.

8) There will be no significant harm to Thanet's SSSI/SAC/SPA/Ramsar sites. A Habitats Regulations Assessment will be required."

4.5.32 **Policy SE04 (Ground Water Protection Zones)** covers all land within and adjacent to the boundary of the airport site. Policy SE04 states that:

> **"Proposals for development within the Groundwater Source Protection Zones identified on Map 19 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 Environment Agency to determine their suitability in terms of the impact of any drainage into the groundwater aquifer."**

4.5.33 **Policy SE05 (Air Quality)** states that:

"All major development schemes should promote a shift to the use of sustainable low emission transport to minimise the impact of vehicle emissions on air quality, particularly within the designated Urban Air Quality Management Area. Development will be located where it is accessible to support the use of public transport, walking and cycling. Development proposals that might lead to a significant deterioration in air quality or an exceedance of air quality national objectives or to a worsening of air quality within the urban Air Quality Management Area will require the submission of an Air Quality Assessment, which should address:

> **1) The cumulative effect of further emissions;**
> **2) The proposed measures of mitigation through good design and offsetting measures that would prevent the National Air Quality Objectives being exceeded or reduce the extent of the air quality deterioration. These will be of particular importance within the urban AQMA, associated areas and areas of lower air quality.**

Proposals that fail to demonstrate these will not be permitted."

4.5.34 **Policy SE08 (Aircraft Noise)** states that:

"Applications for noise sensitive development or redevelopment on sites likely to be affected by aircraft noise will be determined in relation to the latest accepted prediction of existing and foreseeable ground noise measurement of aircraft noise. Applications for residential development will be determined in accordance with the following noise exposure categories:

NEC	PREDICTED AIRCRAFT NOISE LEVELS (Dbl Aeq.0700-23.00)	
A	<57	NOISE WILL NOT BE A DETERMINING FACTOR
B	57-63	NOISE WILL BE TAKEN INTO ACCOUNT IN DETERMINING APPLICATIONS, AND WHERE APPROPRIATE, CONDITIONS WILL BE IMPOSED TO ENSURE AN ADEQUATE LEVEL OF PROTECTION AGAINST NOISE.
C	63-72	PLANNING PERMISSION WILL NOT BE GRANTED EXCEPT WHERE THE SITE LIES WITHIN THE CONFINES OF EXISTING SUBSTANTIALLY BUILT-UP AREA. EXCEPTIONALLY, WHERE RESIDENTIAL DEVELOPMENT IS GRANTED, CONDITIONS WILL BE IMPOSED TO ENSURE AN ADEQUATE LEVEL OF PROTECTION AGAINST NOISE.
D	>72	RESIDENTIAL DEVELOPMENT WILL NOT BE PERMITTED.

Proposed Revisions to Draft Local Plan (Preferred Options) (January 2017)

4.5.35 Following the publication of the draft Thanet Local Plan to 2031 Preferred Options (January 2015), TDC suggested some focused changes to key policies, some of which are relevant to Manston Airport. These changes are set out in the Proposed Revisions to Draft Local Plan (Preferred

Options) (January 2017) and were the subject of a public consultation exercise, running from 19 January 2017 to 17 March 2017.

4.5.36 The local planning authority has significantly amended site specific draft Policy SP05 (Manston Airport) following the commission of an airport viability study by Avia Solutions. This was to look at whether an airport was a viable option for the site within the plan period to 2031. This report took into account national and international air travel and transport and the way in which it is likely to develop over the next 15 to 20 years and looked at previous reports and developments in national aviation. The report (September 2016) concluded that airport operations at Manston are very unlikely to be financially viable in the longer term, and almost certainly not possible in the period to 2031.

4.5.37 Taking on board the conclusions of the airport viability report and given the level of objectively assessed housing need, TDC considered that the best use for the 320ha brownfield airport site was for a mixed-use settlement with the capacity for up to 2,500 new dwellings and up to 85,000sqm of employment and leisure floorspace use, a new district centre and featuring all the amenities needed for a town. The development would also deliver important links across Thanet and improved access to and from the site and provide open space and community facilities that the whole of Thanet can access.

4.5.38 Policy SP05 relates to the site identified in Figure 4.1.2:

Former Airport Site

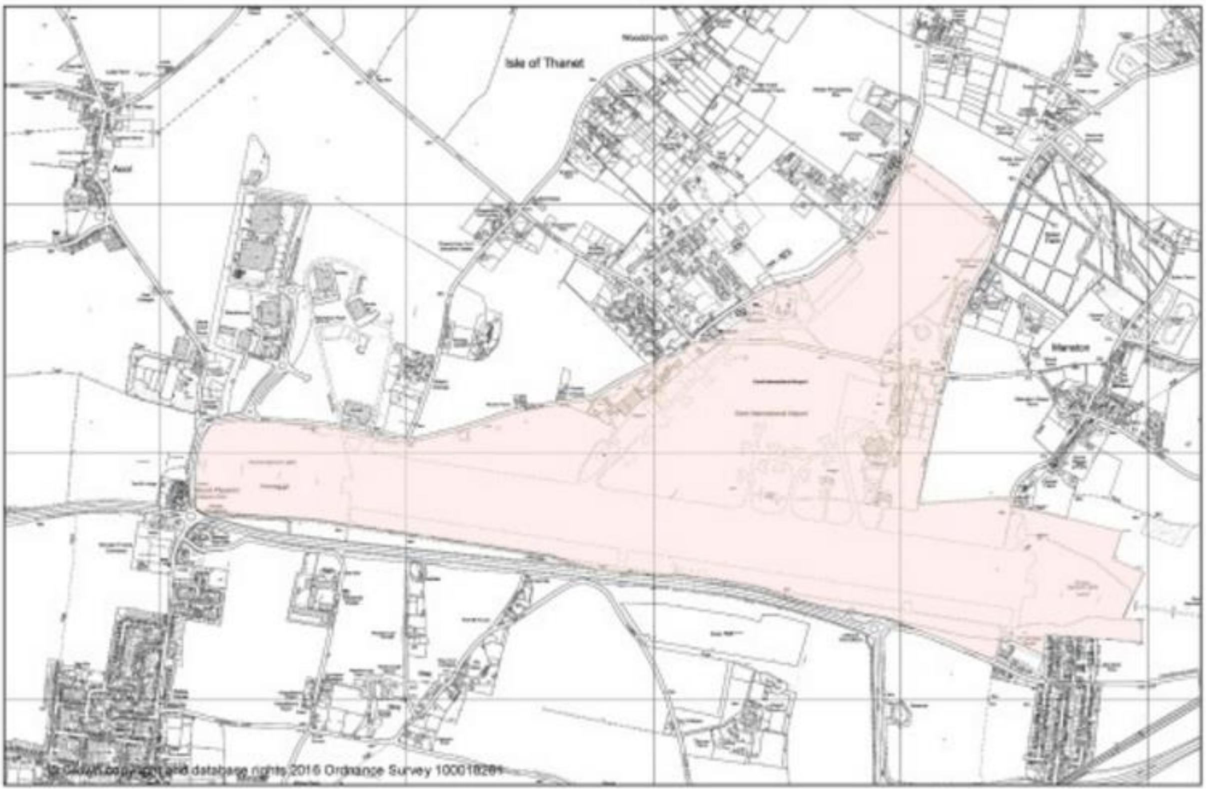


Figure 4.1.2 Extract from Thanet District Council Proposed Revisions to Local Plan (2017) Proposal Maps showing Former Airport Site

4.5.39 Revised draft Policy SP05 (Former Airport Site) states that:

Land is allocated for a mixed-use settlement at the site of the former Manston Airport as defined on the policies map. The site has the capacity to deliver at least 2,500 new dwellings, and up to 85,000sqm employment and leisure floorspace.

The overarching principle of development of this settlement is the creation of a single sustainable settlement that can be easily served by public transport and with good, easily walkable access to central community services and other facilities.

Contributions will be required to meet the following provisions and proposals will be judged and permitted only in accordance with a development brief and comprehensive masterplan for the whole site detailing:

- **How the requirements of the Transport Strategy will be met including the upgrade of Manston Court Road and improvements to Spitfire junction;**
- **The relationship to the Parkway Station and Ramsgate Port including a southern bypass of Manston village and a direct link from the site to the A299 roundabout linking with the southbound dual carriageway;**
- **A travel plan to include a public transport strategy linking the site to existing services, demonstration of how the site links with and relates to neighbouring settlements;**
- **Key routes for traffic-calming measures;**
- **Coherent phasing and evidence of deliverability;**
- **A business plan to demonstrate how the employment will be delivered, and how it will relate and link to Manston Business Park;**
- **The provision of a District Centre to meet the retail need of the development, fit within the retail hierarchy and serve the appropriate catchment, as well as provision of complementary uses such as community business space and leisure uses/recreational facilities; and**
- **Provision of community facilities as outlined in the Infrastructure delivery plan (IDP) including a primary school facility at 4 forms of entry, and a Doctors Surgery.**

A Landscape and Visual Impact Assessment to address:

- **the visual sensitivity of the site focussing on retention of open space and protecting wide open landscape and strategic views; and**
- **how new built development will be designed to minimise visual impact on the open landscape of the central island. Particular attention must be given to**

roofscape for the purposes of minimising the mass of the buildings at the skyline when viewed from the south.

Design and Heritage statements to include:

- **An appropriate landscaping scheme, to be designed and implemented as an integral part of the development;**
- **Provision of 31.77 Ha open space in accordance with Table 7 as required by Policy GI04, and integrated green infrastructure to include walking, cycling and equestrian routes and facilities;**
- **A buffer between the development and Manston Village. Settlement separation between the villages of Manston, Minster, Cliffsend and Acol and Thanet Urban Area;**
- **Pre-design archaeological assessment;**
- **Links to the sites heritage to support tourism in Thanet, including consideration of proposals that would permit a limited element of aviation use;**
- **Detail as to how the runway will be incorporated into the development scheme and what functions it will serve; and**
- **Provision of surface water management/sustainable drainage schemes that will not contaminate groundwater sources, and any proposed initiatives that will improve the condition of the groundwater.**

Development proposals must:

- **Provide an appropriate mix of dwellings to meet the requirements of Policy SP18;**
- **Provide affordable housing to meet the requirements of Policy SP19 (**NB SP19 is being amended to request affordable housing for more than 10 units);**
- **Provide one electric car charging point for every 10 parking spaces provided;**
- **Consider accommodating any self-build requirements included in the self-build register;**
- **Contribute towards the Strategic Access Management and Monitoring scheme to meet the requirements of SP25;**
- **Include an assessment of the sites functionality as a roosting or feeding resource for the interest features of the Thanet Coast and Sandwich Bay SPA Protection Area, including areas within 400m of the development sites boundary, and provide mitigation where necessary;**

- **Retain existing boundary features where possible;**
- **Provide a connection to the sewerage system at the nearest point of adequate capacity, in collaboration with the service provider;**
- **Allow future access to the existing water supply infrastructure for maintenance and upsizing purposes;**
- **Provide for the installation of digital infrastructure; and**
- **Provide a Statement of Social Impacts addressing any needs for community facilities identified in the Infrastructure Delivery Plan.**

4.5.40 Based on the amendment to draft Policy SP05 to provide a mixed-use settlement with residential provision, draft Policy SP11 (Housing Provision) was revised to propose 2,500 residential dwellings at the Former Airport Site. RiverOak has submitted representations strongly objecting to the proposals to allocate the former airport site as a new settlement.

4.5.41 The draft plan was taken to an extraordinary meeting on the 18 January 2018 of the Council for permission to proceed to the publication stage. This would have provided members of the public the opportunity to comment prior to submission to an independent Planning Inspector for examination. During this meeting, Councillors voted by 35 votes to 20 not to progress with Thanet's Local Plan and as such the plan was rejected.

4.5.42 Presently, TDC are continuing to work on the draft local plan. Any delays in the process of the development of the Local Plan may result in the intervention by the Ministry of Housing, Communities and Local Government (formerly the Department for Communities and Local Government), removing TDC's control from the process. At the time of writing, TDC were in the process of seeking Members' views on the next steps to be taken with the draft Plan with a view to moving the Plan forward towards publication for comment under Regulation 19 of the Town and Country Planning Act (Local Planning) (England) Regulations 2012 with subsequent submission of the Plan for examination under Regulation 22.

Dover District Council

4.5.43 The statutory Development Plan for DDC comprises:

- Dover District Core Strategy (adopted September 2010);
- Dover District Land Allocations Local Plan (adopted January 2015);
- Dover District Proposals Map; and
- Dover District Local Plan (Saved Policies) (2002).

4.5.44 A review of DDC's planning policy has not identified any planning policy of relevance to the reopening of Manston Airport. The Core Strategy only contains a reference to the location of Manston Airport.

4.5.45 DDC are in the process of producing a new Local Plan. The new Local Plan will cover the period from 2014 to 2037 and will set out the key policies for the District. DDC has identified Manston Airport as a cross-boundary strategic priority for planning. DDC expects to publish the proposed Local Plan draft for public consultation in July 2019.

Canterbury City Council

4.5.46 The statutory Development Plan for CCC comprises:

- Canterbury District Local Plan (July 2017) and Proposals Map[10]; and
- Herne Bay Area Action Plan [11] (adopted April 2010)

4.5.47 A review of CCC's Development Plan documents has not identified any planning policy of relevance to the reopening of Manston Airport. However, the Local Plan does recognise that the NPPF encourages Local Authorities to plan proactively for the transport infrastructure necessary to support the growth of airports.

4.6 Other Relevant Plans and Policies

South East Local Economic Partnership – Strategic Economic Plan (March 2014)

4.6.1 Kent, Medway, Essex, Thurrock, Southend and East Sussex together comprise the South East Local Enterprise Partnership (SELEP) area. By 2021, the SELEP aim is to generate 200,000 private sector jobs (an average of 20,000 a year, or an increase of 11.4% since 2011); complete 100,000 new homes, increasing the annual rate of completions by over 50% compared to recent years; and lever investment totaling £10 billion, to accelerate growth, jobs and homebuilding.

4.6.2 The Growth Deal includes:

- Establishing a £5.2bn SEFUND revolving property investment fund to create the conditions for economic growth by providing the infrastructure necessary to boost business and jobs;
- Delivering the biggest local transport programme in the country to realise the potential of our growth corridors and sites, transforming connectivity for our businesses and residents unlocking jobs and homes, and bringing substantial benefits to the UK economy;
- Boosting the productivity of our businesses by bringing together local and national business support services, supplementing access to finance and encouraging closer links to be forged between business and the HE and FE sector; and
- Investing £128m in skills capital projects aligned to our growth opportunities, stimulating new competition and further strengthening employer influence over wider skills provision.

4.6.3 To realise the growth ambitions for the area, the Plan recognises that the area needs to build upon its economic strengths but that there are challenges which are identified as follows:

- **Gateway to the World** - SELEP's sea ports – and the road and rail networks that serve the ports - provide the UK's most important gateway to the rest of the world. On-going investment in the motorways, national trunk roads and rail networks serving the SELEP's ports is essential to ensure their efficient operations. The congestion arising from the lack of such investment has a material, immediate impact on the productivity of companies throughout the UK and the performance of the UK economy as a whole. Many SELEP businesses and communities find that the lack of investment

[10] Canterbury District Local Plan (2017) Canterbury City Council. Available online at https://www2.canterbury.gov.uk/media/1507001/Canterbury-District-Local-Plan-Adopted-July-2017.pdf [Checked 14/11/17].
[11] Herne Bay Area Action Plan (2010) Canterbury City Council. Available online at https://www2.canterbury.gov.uk/media/512291/HerneBayAreaActionPlanlowres.pdf [Checked 14/11/17].

in the national road network means that they carry significant additional costs arising from congestion. Access to the Channel Ports is also frequently constrained and planned increases in freight and passenger traffic through the Port of Dover and the Channel Tunnel are likely to place further pressure on the M20/A20 and M2/A2 Corridors. Operation Stack directly costs Kent Police and the Highways Agency around £3 million per year, with a wider economic cost in lost investment and delays to local business.

- **The Workforce** - economic activity is not evenly spread across the SELEP area. Unemployment tends to be higher in more peripheral parts of the LEP, particularly in the coastal communities, and some other areas. Gravesham (9.3%), Medway (10.1%), Tendring (9%), Thanet (12.3%), Hastings (10.7%) and Harlow (9.8%) have the highest rates of unemployment and are in the top fifth of local authorities in England on this measure.
- **Entrepreneurial Business Culture**
- **Universities and Innovation** – there are nine universities across the SELEP which represent a powerhouse for new knowledge creation, innovation and, along with business, are a driving force behind major economic growth across the LEP.
- **Sector Strengths and Prospects: Rebalancing the Economy –** there are significant opportunities to rebalance the SELEP economy in favour of high value-added manufacturing and services, and to reduce the reliance on low value sectors. There are priority sectors for the SE LEP economy that have been identified which have high growth potential. These are advanced manufacturing; life sciences/medical technologies; transport and logistics; low carbon environmental goods and services, creative, cultural and media and the visitor economy. Within each of these sectors, SELEP makes an important contribution to national output, employment and businesses.
- **Transport and Logistics –** SELEP identifies significant opportunity for growth in the transport and logistics sectors. The Plan fully recognises that smaller seaports in the area, as well as three smaller airports (including Manston Airport), also all offer further growth potential.
- **Creative, cultural, and media and the visitor economy** - the tourism sector is a significant sector in the SELEP area. The visitor economy is particularly important in SELEP's rural and coastal areas. SELEP makes the largest GVA contribution to the creative industries sector of any LEP outside of London and is in an excellent position to take advantage of opportunities to build up a supply chain for London, the world's leading creative centre.

4.6.4 In terms of Manston, paragraph 2.38 states that the area around Manston and Discovery Park contains extensive land suitable for residential and employment use, and is well connected by new infrastructure. The SELEP were seeking an extension of the designated Discovery Park Enterprise Zone for Manston following the airport's announcement to close with a Manston Airport task force to be established with local MPs.

4.6.5 The Discovery Park and Manston Growth Deal states that a coordinated approach to the development of Discovery Park and Manston needs to be taken forward and that the Kent and Medway Entreprise Partnership (KMEP) will:

- Consider extending Enterprise Zone designation to Manston Business Park, Manston Airport and the Richborough Corridor. KMEP will ask Government to permit Thanet District Council to retain 100% of business rate receipts within the Zone with no impact on their baseline, in order that discounts can be fully funded by receipts above the discount level;
- Allocate £3.5 million in Local Growth Fund finance to support commercial development at Manston and Discovery Park; and
- Support SEFUND investment in commercial and residential development. Alongside this, KMEP will seek Local Growth Fund transport investment in Thanet Parkway station as a priority to reinforce the success of Discovery Park and support investment at Manston as well as in the Westwood Relief Strategy, eliminating a major bottleneck impacting on employment and commercial growth in Thanet Central Island.

South East LEP (SELEP) Strategic Economic Plan - Evidence Base (September 2017)

4.6.6 The next South East of England Local Enterprise Partnership (SELEP) Strategic Economic Plan is being prepared. An evidence base report has been produced and sets out the strategic priorities that will shape the next plan (which is due to be published early 2018).

4.6.7 One of the key strategic priorities for the new plan is to encourage trade and inward investment and in particular, encourage more international trade. The SELEP recognises that significant value can be achieved for the SELEP economy from encouraging more businesses to trade overseas and foreign owned companies to locate in the UK.

4.6.8 However, the report recognises that the smooth running of the SELEP gateways is something which desperately needs to be maintained, as the potential for significant delays being experienced at the borders, post Brexit, is not something that the evidence suggests either the SELEP or the national economy can cope with.

4.6.9 To achieve these ambitions, the report acknowledges that there needs to be an improvement in the SELEP productivity, and to do this, there needs to be an infrastructure upgrade including commercial property and transport infrastructure, and better alignment with central government infrastructure investment with local growth priorities – building on the Kent Growth and Infrastructure Framework (see below).

4.6.10 Paragraph 12.0.18 recognises that a number of ports in the SELEP region are also keen to expand to enable them to deal with increased heavy bulk freight. If the UK aspired to be a top international trading nation, encouraging and supporting port investment is vital according to the SELEP.

East Kent Growth Framework – the East Kent Growth Plan – Final Draft Report (2017)

4.6.11 The East Kent Growth Plan (2013) 'Open for Growth' prepared by the East Kent Regeneration Board has been withdrawn and is in a process of being replaced. The East Kent Growth Framework - Final Draft Report – prepared by the East Kent Regeneration Board was published in August 2017 and will replace the withdrawn East Kent Growth Plan (2013).

4.6.12 The East Kent Growth Framework (EKGF) sets out an overarching strategic approach for identifying investment priorities to achieve long-term economic growth across East Kent between 2017 and 2027. Four key objectives have been identified as the 'building blocks' for driving continued and sustained growth and focusing future investment across East Kent which are:

1. Unlocking growth through infrastructure - to enhance domestic and international connectivity while enabling local accessibility.

2. Delivery of business space – to help attract new investment into the area while driving forward the development of brownfield sites.

3. Supporting skills and productivity within business – ensuring that businesses have the skills to grow and that the skills base continues to improve (which is linked to the success of higher education and further education sectors creating talent).

4. Place making and shaping – improve the perception of people's idea of East Kent and make it a location of first choice that retains and attracts young people, families and entrepreneurs.

4.6.13 Given the extent of international connectivity, the report recognises that upgrading infrastructure within and around East Kent will also bring national benefits, with the effect that the potential return on investing in East Kent's infrastructure will be higher than elsewhere in the UK due to the sub-region's strategic location between mainland Europe, London and the rest of the country. The case for investing in strategic infrastructure is further strengthened by the UK's upcoming exit from the European Union and the potential impacts that post-Brexit border controls could have upon a number of locations in East Kent. However, Brexit may also offer opportunities for East Kent, such as growth in sectors associated with freight clearance and supply chain growth (paragraph 3.10).

4.6.14 Paragraph 3.11 states that maximising the opportunities for economic growth in East Kent requires thinking beyond the East Kent boundaries for transport infrastructure. For example, the Lower Thames Crossing is critical to facilitating future growth and improving productivity and resilience for businesses in the wider economy and will also impact on East Kent. At a national level, the Lower Thames Crossing provides a critical piece of infrastructure for enabling the effective transportation of goods from the UK to Europe and it is important that investment in Kent's strategic road infrastructure keeps pace to ensure that this route to market can sustain increasing volumes of traffic without adversely affecting the day-to-day operations of East Kent's business community.

4.6.15 A total of 36 projects have been identified as being strategically-significant for the future economic growth of East Kent. Thanet Parkway Station is identified as one such project. Improving connectivity is a vital step in unlocking growth potential and attracting the necessary investment and job opportunities for local people. In particular, the Parkway Station will provide significantly improved access to the former Manston Airport site.

Kent and Medway Growth and Infrastructure Framework (GIF) 2018 Update

4.6.16 The GIF has been prepared by KCC to provide a view of emerging development and infrastructure requirements to support growth across Kent and Medway. The GIF provides a strategic framework across the County, for identifying and prioritising investment across a range of infrastructure, for planned growth up to 2031.

4.6.17 The GIF recognises that Kent and Medway is the strategic gateway from the UK to continental Europe. It alos acknowledges that Kent and Medway is facing increased congestion on both road and rail infrastructure £9.96bn is required for major transport projects including the Lower Thames Crossing and associated strategic road corridor through to the Channel ports, Crossrail extension to Ebbsfleet, a solution to Operation Stack and lorry parking. The GIF does not identify Manston Airport or aviation as a strategic transport priority for the county. Thanet Parkway Railway Station is identified as a priority rail project in the GIF.

4.6.18 The GIF identifies the Manston Airport/Stonehill Park site as an employment site (Figure 7.5: East Kent - example strategic projects for economic growth) and Thanet Parkway Railway Station as strategic priority.

A Vision for Kent 2012-2022 by the Kent Forum (2012)

4.6.19 This statement outlines the challenges facing Kent and the priorities for the county. It lists three ambitions as follows:

- **Ambition 1: To grow the economy** - For Kent to be open for business with a growing and successful economy and jobs for all. Kent's future prosperity is dependent upon a thriving business sector that generates wealth. A strong, diverse and resilient economy is the glue that holds our communities together, giving individuals opportunities and putting money in families' pockets. A successful economy is fundamental to the second of our ambitions - to tackle disadvantage. The commitments are to:
  - To deliver the critical infrastructure that will create the conditions for economic growth across Kent;
  - To raise the career aspirations of Kent's residents, from early years through to adulthood, and to meet those increased aspirations with a range of learning opportunities, apprenticeships and internships that meet future business need.
  - To be business friendly and the county of choice for inward investment and expansion.
- **Ambition 2: To tackle disadvantage** - For Kent to be a county of opportunity, where aspiration rather than dependency is supported and quality of life is high for everyone. The commitments are to:
  - To reduce the number of Kent residents on out-of-work benefits.
  - Inspire young people to become engaged in their families, schools and communities, so they take full advantage of all the learning, recreational and development opportunities (including volunteering), that are a foundation for achieving their lifelong potential.
  - To ensure there is choice of high quality and accessible services that will tackle disadvantage.
- **Ambition 3: To put citizens in control** - For power and influence to be in the hands of local people so they are able to take responsibility for themselves, their families and their communities.

Facing the Aviation Challenge – Kent County Council (August 2014)

4.6.20 This document set out KCC's reasons for opposing the proposals for an airport on the Isle of Grain, which the Airports Commission investigated in 2014 and it presented KCC's view on UK aviation.

4.6.21 KCC is of the view that the UK needs to be able to connect with emerging markets now, in time to stop the UK's continued slide against its competitors, and the quickest way of addressing this is to build on our current aviation infrastructure (rather than building a new multi runway hub airport in the Thames Estuary).

4.6.22 If additional runway capacity is not provided in anticipation of forecast demand growth, KCC are concerned that "delays and disruption at London's airports will steadily worsen and there is no room for connectivity growth to new markets. As a result, the UK will become less accessible than its rivals to strategically important locations in the world economy and the UK's future economic prosperity will be threatened. With the current UK economic situation, it is all the more important that this industry, so vital to our country's economy, is invested in, protected and expanded to meet growing needs. In the interests of the national economy the need to act is now."

4.6.23 In the document, KCC confirmed that it fully supports growth in UK aviation in order to improve the UK's connectivity and competitiveness, thus supporting economic growth and job creation.

4.6.24 The right solution to addressing capacity needs in KCC's view is to utilise, improve and expand existing airports. It felt that provision of additional capacity at some existing airports, together with improved surface access by rail will facilitate better strategic use of the London/South East multi-airport system. KCC felt that better utilisation of regional airports such as London Ashford Airport at Lydd in Kent and London Southend Airport, for point to point flights, will also release extra capacity and complement the main London airports that provide 'hub' operations. This also provides a solution to the capacity problem in the short and medium term while new runways are constructed at the main London airports over the longer term.

4.6.25 KCC recognise that regional airports also have a role, as demonstrated by the available capacity at Southend Airport where significant private sector investment has already taken place. Development of a new Lower Thames Crossing to the east of Gravesend will expand Southend Airport's catchment area, including improved access from Kent, and will further enhance the airport's prospects. Similarly, at Lydd Airport in Kent, private investment is forthcoming.

4.6.26 Following its closure as a commercial airport in May 2014, KCC recognised that a financially viable and sustainable future must be found for Manston airport and that this should focus on the use of the site for aviation and related services as well as other businesses that can bring jobs and economic growth to East Kent.

Kent County Council – Manston Airport under private ownership: The story to date and Future Prospects (March 2015)

4.6.27 This document sets out the story of Manston Airport from its sale by the Ministry of Defence to the present day. KCC also considers the future for the airport which it is confident will be bright. The document confirms that the Council has always supported Manston and they have invested substantial sums of public money to the cause. They have also made substantial investments in both road and rail infrastructure to improve access to Manston and East Kent.

4.6.28 The document confirms that the County Council remain committed to seizing the best opportunity for Manston Airport by creating a significant number of new jobs and bringing prosperity into East Kent.

Kent County Council Position Statement on Manston Airport (July 2015)

4.6.29 The County Council's position as set out in the meeting of the County Council on 16th July 2015 is:

> **"That we the elected members of KCC wish it to be known that we fully support the continued regeneration of Manston and East Kent and will keep an open mind on whether that should be a business park or an airport, depending upon the viability of such plans and their ability to deliver significant economic growth and job opportunity."**

Local Transport Plan for Kent 4: Delivering Growth without Gridlock 2016-2031 (2017)

4.6.30 In terms of countywide priorities, KCC confirms that its position on aviation is as set out in 'Facing the Aviation Challenge' which is to maximize use of existing regional airport capacity, along with some expansion of existing airports and improved rail connections. In respect of Manston Airport, the plan recognises that it ceased to operate on 15th May 2014 and that the County Council's position as set out in the meeting of the County Council on 16th July 2015 (see above).

4.6.31 KCC state that processes are needed to properly measure, minimise and mitigate the noise impacts of existing airport operations and airport expansion. They oppose a second runway at Gatwick; one of the reasons for this is the doubling of the already unacceptable noise impacts. KCC state that there needs to be an immediate reduction in overflight and noise in West Kent and so they oppose proposed airspace changes that would not share the burden of overflight equitably between communities. They state that multiple arrival and departure routes should be used to provide periods of respite.

4.6.32 In light of the County Council's long-term aviation capacity issues, they are pressing Government for immediate action to keep UK airports competitive with European airports in terms of Air Passenger Duty (APD). KCC recognise that this currently has a negative impact on the UK's global connectivity and is therefore damaging UK business and tourism. The Council recognises that differential charging of APD at uncongested airports could also help to stimulate growth at regional airports and free up capacity at congested airports.

4.6.33 The County Council is also seeking to deliver a new railway station to significantly improve rail connectivity to the area (Thanet Parkway Rail Station). The station will provide access to greater employment opportunities for local residents, and increase the attractiveness for investment in Discovery Park Enterprise Zone and numerous surrounding business parks in Thanet. It will also support local housing and any reopened airport at Manston. KCC recognises that East Kent has a real opportunity for growth but is currently beyond an hour's journey time from London which discourages employers from location in the area. As regeneration in East Kent is dependent on improving accessibility, the new Parkway Station is proposed to enhance the accessibility of the wider area of East Kent.

Thanet Destination Management Plan (2013)

4.6.34 Thanet District Council (TDC) set out a number of objectives to attract more visitors. These objectives include:

- Make more of its location – the Isle, the big skies, the natural coastline and importantly its proximity to London by high-speed train and the market opportunities that bring.
- Ensure tourism is one of the drivers of the local economy and put steps in place to enable that, including supporting tourism business sustainability, growth and inward investment.

UKIP Manifesto – Policy Pledges (2015)

4.6.35 UKIP won the local Council elections in Thanet 2015 on the back of a promise to reopen Manston Airport. This demonstrated significant local support for bringing back the airport into aviation use.

Thanet District Council Corporate Plan 2016-2020 (2016)

4.6.36 The Corporate Plan for Thanet sets out the Council's aspiration to grow the local economy so that Thanet can thrive. Priority no. 3 is to promote inward investment and job creation. The Plan states that TDC's vision is to:

> **"……..accelerate growth and achieve greater economic prosperity for our district. We will seek opportunities for inward investment, high quality job creation and work with partners to ensure we have the right skills, infrastructure and plans in place.**
>
> **This will involve us:**
>
> - **Actively seeking inward investment, exploring the potential for using Enterprise Zones; encouraging new and existing businesses which support growth in the local and visitor economy.**
> - **Working with partners to make the most of the buildings and land we own. Maximising commercial opportunities for key assets.**
> - **Writing a Local Plan which sets planning strategies and policies that support growth of the economy.**

- **Working with education and training providers to develop the skills agenda for the benefit of residents and local businesses."**

Draft Thanet Transport Strategy 2015-2031 (October 2017)

4.6.37 Section 5.7 relates to Thanet Parkway Rail Station and states that the County Council's Transport Delivery Plan identifies key opportunities and challenges to be addressed to deliver long-lasting regeneration and economic growth in the County. It recognises that many of Thanet's existing rail stations are difficult to reach by sustainable transport and offer limited car parking opportunities. This causes some commuters to travel significantly longer distances by car to access stations with better parking facilities. The new station project's objective is to support growth at Manston, Business Parks around Westwood and Discovery Park. The following outcomes are expected from the delivery of the station:

- Increased inward investment in Thanet and Dover.
- Thriving Enterprise Zone and surrounding Business Parks.
- Greater employment opportunities for Thanet and Dover residents.
- Access to high speed rail services across district.

4.6.38 The new station will deliver 'headline' opportunities as follows:

- Improved air quality; reduced congestion; reduced noise pollution; and less carbon emissions;
- £10m funding from Government (with every £1 that is invested to generate more than £2.12 in benefits);
- Reduce the perceived remoteness of Thanet from London;
- Improved connectivity to the wider job market;
- Quicker journeys to London, Ashford and wider Kent; and
- An integrated transport package will be delivered.

4.6.39 It is anticipated that journey times from London to the Thanet Parkway would reduce to 1 hour, providing a significant boost to tourism, and regeneration of the area and enhancing access to private sector employment at Ashford and Ebbsfleet.

4.6.40 The report also identifies a 'traffic challenge' at the B2050 / B2190 - Spitfire Junction which is recognised as a very important local route with the A299, which is one of the primary arterial routes serving Thanet, for locally bound traffic to Margate, Broadstairs and Ramsgate. TDC explain that several designs have been considered at this junction to seek to improve junction performance and safety, however the alignment of the carriageway of the B2050 and the availability of residual highway land currently present geometrical challenges to an alternative approach.

4.6.41 The Strategy identifies the Former Manston Airport site as a key development site in the new Thanet Local Plan and states that it is essential that redevelopment of this site positively contributes towards wider off site road links, in order to manage potential impacts on the surrounding highway network such as Manston Village and Manston Court Road. Manston Court Road (between Valley Road and the B2050 Manston Road) will require significant improvements to widen the carriageway to form a local distributor road.

4.6.42 It is anticipated that a new highway link would be created on the existing Northern Grassland (part of the Former Manston Airport Site allocation). The nature and route of this link will depend on the final masterplan for the site. It will be necessary for developers of both the Former Manston Airport Site and Land Adjacent to Manston Court Road to make significant improvements (or financial contributions if deemed appropriate) towards the road network surrounding the site allocations. These would include the upgrade of Manston Court Road as a direct link to and from Westwood and new / improved links to the existing dual carriageway on Spitfire Way fronting Manston Business Park.

4.6.43 Spitfire Junction will need to be reconfigured to address existing capacity and safety concerns and access to this junction from the A299 will need to be controlled or restricted to avoid excessive use of Manston Road for Margate Bound Trips.

Thanet Draft Infrastructure Delivery Plan (November 2016)

4.6.44 The plans for a new Thanet Parkway rail station are listed in the schedule of key local plan infrastructure. The new station will have 300 parking spaces and will be located at Cliffsend and will include plans for sustainable travel links to the new station.

Economic Growth Strategy for Thanet (November 2016)

4.6.45 The strategy recognises that Thanet has a distinctive local economy with substantial opportunities for sustainable and high quality economic growth - particularly with HS1 in place, Thanet now has significant locational advantages deriving from its proximity to both London and continental Europe. Looking ahead, the strategy recognises that there is real potential linked to the port and historic marina at Ramsgate and emerging opportunities in the fields of advanced manufacturing, agri-tech and the creative sector. While there are some challenges – relating particularly to the creation of jobs locally and workforce skills – the opportunities are real ones, particularly in the wider context of significant planned housing and population growth.

4.6.46 The Economic Vision for Thanet is:

> **"Thanet is a great place to live, work and invest, rivalling its counterparts across the UK. Its economy will grow quickly in both relative and absolute terms**
>
> **Transformational Initiatives**
>
> **1: Developing the Port at Ramsgate**
>
> **2: Investing in high value manufacturing and engineering across Thanet and East Kent**
>
> **3: Positioning Thanet as a global agritech hub**
>
> **4: Promoting Thanet's broader cultural/leisure offer**
>
> **5: Cultivating the creative industries across Thanet**
>
> **6: Designing enterprise into communities**
>
> **7: Long term feasibility modelling for Margate and Ramsgate**
>
> **Foundational Priorities**
>
> **1: Working with businesses, schools and FE/HE providers to improve workforce skills**
>
> **2: Developing and implementing measures to support new and small businesses in the District, particularly the provision of managed workspace and focused business support**
>
> **3: Ensuring major employment sites in Thanet are managed and promoted effectively**

4: Working with local partners to ensure that the visitor economy continues to evolve, reflecting fast-changing patterns of demand."

4.6.47 Data suggests that the local economy which is "on the up" with businesses choosing to invest in Thanet, and people are choosing to live and work there. The strategy recognises that there continues to be many challenges. The skills profile could be strengthened; too many jobs are "low wage" and part time in character; and the number of jobs within the District needs to grow. There is also a need to diversify the business base so it is less reliant on 'public sector' type roles (36% in health, education and public administration).

4.6.48 Inland, the strategy recognises the Manston Airport site is a serious potential opportunity for Thanet's economy going forward. It recognises that as part of the Local Plan process, Thanet District Council will be required to make a decision in relation to the future use of the site for the future direction of economic growth District-wide.

4.6.49 The strategy identifies Thanet's economic strengths but also its threats and weaknesses which are summarised as follows:

- A need for further investment in workforce skills;
- Viability and developer challenges in the successful delivery of new development or relocation of existing businesses on major employment sites;
- A tourism sector which is important to the area, and where growth in private investment in recent years needs to be supported and developed further. Hotels are at capacity at peak times and a lack of high quality accommodation;
- Towns in need of a more clearly defined economic purpose; within specific areas / zones;
- Increased competition and market challenges are impacting upon town centres – which in the context of fast changing public expectations requires a renewed focus;
- Ongoing uncertainty surrounding the future of the former Manston Airport site;
- Uncertainties linked to the process of Brexit;
- Despite growing confidence within the area, there are still some external perception issues to be addressed; and
- A Local Enterprise Partnership that is becoming more complex and competitive and where Thanet needs to promote its priorities and justify its "asks".

Thames Estuary 2050 Growth Commission – 2050 Vision (June 2018)

4.6.50 The report sets out a vision and delivery plan for north Kent, south Essex and east London up to 2050. The Commission's analysis shows that the Thames Estuary could generate an additional £190 billion of Gross Value Added (GVA) and 1.3 million new jobs by 2050. It estimates that at least 1 million new homes will be needed to support this growth.

4.6.51 The Technical Report recognises that the Thames Estuary contains some significant transport infrastructure that supports the people and places within it. Manston Airport is identified as a smaller airfield which is now closed but which is the subject of plans for mixed use re-development as well as a development consent order for aviation uses.

4.6.52 The Commission's overarching objectives are as follows:

Productive Places

4.6.53 The places of the Thames Estuary will support the sustained growth of its high value, healthy wage sectors achieving up to 1.3 million new jobs by 2050. Existing sectors will be strengthened including freight and logistics and construction, maximising opportunities from existing assets such as the ports. Emerging sectors will be nurtured including: health, reflecting the supercentre in Kent; niche heritage and wildlife tourism in Kent and Essex; and the Thames Estuary Production Corridor - a ribbon of creative and cultural industries along the River Thames. In part and as a whole, the places will harness entrepreneurial spirit, strong educational institutions and unique natural assets to create a distinctive and productive network of economies.

Connected Places

4.6.54 There will be improved connections between and within cities, towns, villages and industries be it for people or goods. This will support improved productivity through increased access to jobs and services. New and improved rail, bus, cycle and pedestrian links will reduce car dependency and increase the use of the area's integrated public transport systems. Completing the Thames Path will also improve connections for recreation for cyclists and pedestrians. The area will benefit from the highest level of digital connectivity, adopting the latest technological innovation. New river crossings such as the Lower Thames Crossing and Silvertown Tunnel will strengthen local and national links. New railway infrastructure including the extension of Crossrail 1 to Ebbsfleet and the Thames East Line will connect into the country's high speed network and complete the orbital railway around the Capital.

Thriving Places

4.6.55 The growing communities of the Thames Estuary, which will be home to 4.3 million people by 2035, will pride themselves on their rich cultural and economic activity. Through people-led projects - in part delivered through the Thames Estuary Fund - each distinctive city, town and village will be the well-loved heart of the community. They will demonstrate the importance of good design and creating attractive places that work for the community. Improved educational attainment and local skills will increase aspiration and show that new job opportunities are for them. These thriving places will be attractive to investors and will celebrate their individual sense of place by offering bespoke opportunities to live, work, visit and play within the Thames Estuary setting.

Affordable Places

4.6.56 A further 1 million high-quality homes, balanced to suit the affordable needs of the community, will be provided by 2050. They will offer a diversity of choice to all parts of the community, including ageing populations, and ensure that supply keeps pace with demand. The production of statutory Joint Spatial Plans will set out where these homes will be located and include tools, such as design review panels, to ensure high-quality development is delivered. Healthy lifestyles will be supported by the provision of new social places alongside integration with existing places and community networks. This will support resilient communities that respond to the needs of residents throughout their lives.

Adaptable Places

4.6.57 The many places and spaces in the Thames Estuary will adapt to the changing environment ensuring the people, economies and ecology of the area thrive. Infrastructure investment will be integrated and multi-functional, maximising the benefits to people, places, and ecology. This will assist in the creation of nearly 900 hectares of new habitat by 2100 to replace the 1,200 hectares lost to tidal flooding. Projects such as the completion of the Thames Path will provide improved access to the natural environment. The use of natural assets for recreation and economic activity will be balanced with their protection and enhancement.

Deliverable Places

4.6.58 The Thames Estuary will complete what it has started; delivering the homes and the balanced jobs it has planned, at the required scale and pace, in order to create thriving and affordable places. This will be achieved through robust, locally-led governance structures, which build on existing partnerships and bring together, as needed, the 18 local authorities, plus the three upper tier authorities. The area will also be a space to try something - a place that supports innovative models of delivery be that through capitalising on Modern Methods of Construction (such as modular homes) or innovative models of public sector housing delivery. Across the many places of the Thames Estuary this will enable the significant aspirations to become meaningful realities.

4.6.59 Thanet is located within the North Kent Foreshore area. The Commission's vision for North Kent Foreshore is:

> **"At the heart of a new medical research corridor, North Kent Foreshore will be home to a supercentre of health and wellbeing. Through a statutory Joint Spatial Plan, and strong connections between local government and business, the area will balance delivering growth in the health sector with new jobs, new homes, a renewed focus on skills, and high-quality town centres set around world-class heritage and natural assets."**

4.6.60 The Commission recognises that there are significant opportunities for growth and development in North Kent Foreshore. Their Priority Areas of Change (pages 24 and 25) in the North Kent Foreshore area include Canterbury, Margate and Ramsgate. In has identified three priorities as follows:

- North Kent Foreshore Fund
- Education and Skills
- Health Supercentre

4.6.61 Specifically in relation to education and skills, the Commission states that it wants to implement a more targeted skills strategy with employers and educational institutions that provides clear pathways to employment that support the area's existing and growing economic sectors. This is to address generational skills shortfalls. It will improve educational attainment and skills in the area, across multiple age groups, therefore reducing levels of unemployment. The aim is for KCC to work with the local authorities, the Local Enterprise Partnership, employers and/or educational institutions to develop a targeted plan for the area, which meets current and future employer needs. It is clear that reopening Manston Airport will help to achieve this priority in addition to helping to achieve the overarching objectives for the 2050 Vision. It will also stand to benefit from many of the initiatives that are being brought forward not least by improving connectivity and generating productive places.

Appendix 6.1

List of Receptors

6.1.1 This appendix provides tables listing details of the specific receptors at which concentrations were modelled (in addition to the gridded receptors). Details of how these receptors were chosen are given in **Section 6.4**.

6.1.2 **Table 6.1** provides details of the human receptors, **Table 6.2** and **Table 6.2a** provide~~s~~ details of the ecological receptors, and **Table 6.3** provides details of the monitoring locations used as receptors.

Table 6.1 Human receptor locations

ID	Description	Easting	Northing	Height	Notes
H01	Garden Cottage	631215	166224	1.6	Long- and short-term
H02	Cleve Court	631165	166314	1.6	Long- and short-term
H03	Cleve Court Farm	631186	166424	1.6	Long- and short-term
H04	Oast Cottages	631003	166651	1.6	Long- and short-term
H05	Acol	630864	166832	1.6	Long- and short-term
H06	Alland Grange	632086	166298	1.6	Long- and short-term
H07	Alland Grange Lane	632159	166430	1.6	Long- and short-term
H08	Rose Farm	632489	166193	1.6	Long- and short-term
H09	Pouces Cottages	632629	166210	1.6	Long- and short-term
H10	Bell Davies Drive 1	633019	166385	1.6	Long- and short-term
H11	Bell Davies Drive 2	633039	166403	1.6	Long- and short-term
H12	Manston Road 1	633126	166502	1.6	Long- and short-term
H13	Defence Centre	633285	166619	1.6	Long- and short-term
H14	Coach House	633912	166981	1.6	Long- and short-term
H15	Manston Court Road	634183	166374	1.6	Long- and short-term
H16	Wood Farm	634509	166374	1.6	Long- and short-term
H17	Manston Road 2	634621	166241	1.6	Long- and short-term
H18	Manston Road 3	634640	166153	1.6	Long- and short-term
H19	High Street 1	634680	166079	1.6	Long- and short-term
H20	High Street 2	634651	165954	1.6	Long- and short-term
H21	High Street 3	634584	165938	1.6	Long- and short-term
H22	High Street 4	634694	165880	1.6	Long- and short-term

ID	Description	Easting	Northing	Height	Notes
H23	High Street 5	634455	165807	1.6	Long- and short-term
H24	Highlands Glade	635028	166030	1.6	Long- and short-term
H25	Spratling Court Farm	635479	166321	1.6	Long- and short-term
H26	Spratling Lane	635757	166282	1.6	Long- and short-term
H27	Auckland Avenue	636106	166044	1.6	Long- and short-term
H28	Manston Road 4	636063	165787	1.6	Long- and short-term
H29	Ozengell Grange 1	635661	165661	1.6	Long- and short-term
H30	Ozengell Grange 2	635606	165627	1.6	Long- and short-term
H31	Kentmere Avenue	635903	165323	1.6	Long- and short-term
H32	Canterbury Road East	635777	165134	1.6	Long- and short-term
H33	Sea View Road	634774	165056	1.6	Long- and short-term
H34	Windsor Road	634770	165249	1.6	Long- and short-term
H35	Arundel Road 1	634726	165251	1.6	Long- and short-term
H36	Arundel Road 2	634682	165251	1.6	Long- and short-term
H37	King Arthur Road 1	634646	165253	1.6	Long- and short-term
H38	King Arthur Road 2	634602	165260	1.6	Long- and short-term
H39	King Arthur Road 3	634603	165217	1.6	Long- and short-term
H40	King Arthur Road 4	634601	165182	1.6	Long- and short-term
H41	King Arthur Road 5	634599	165138	1.6	Long- and short-term
H42	King Arthur Road 6	634596	165101	1.6	Long- and short-term
H43	Canterbury Road West 1	634450	165100	1.6	Long- and short-term
H44	Canterbury Road West 2	634382	165134	1.6	Long- and short-term
H45	Clive Road	634518	164793	1.6	Long- and short-term
H46	Thorne Farm 1	633418	164980	1.6	Long- and short-term
H47	Thorne Farm 2	633287	164842	1.6	Long- and short-term
H48	Red Cottages	633076	164912	1.6	Long- and short-term
H49	Ivy Cottage Hill 1	632465	165443	1.6	Long- and short-term
H50	Ivy Cottage Hill 2	632426	165384	1.6	Long- and short-term
H51	Ivy Cottage Hill 3	632378	165324	1.6	Long- and short-term
H52	Way Hill 1	632242	165162	1.6	Long- and short-term
H53	Way Hill 2	632166	165091	1.6	Long- and short-term
H54	Dellside	632064	165515	1.6	Long- and short-term

ID	Description	Easting	Northing	Height	Notes
H55	Wayborough House	632023	165273	1.6	Long- and short-term
H56	Tothill Street 1	631079	165231	1.6	Long- and short-term
H57	Fairfield Road	630849	165341	1.6	Long- and short-term
H58	Burgess Close	631238	165328	1.6	Long- and short-term
H59	Hill House Drive	631258	165433	1.6	Long- and short-term
H60	Southall Close	631203	165516	1.6	Long- and short-term
H61	Premier Inn	631139	165561	1.6	Long- and short-term
H62	Holiday Inn	631045	165700	1.6	Long- and short-term
H63	Mount Pleasant 1	631091	165778	1.6	Long- and short-term
H64	Mount Pleasant 2	631111	165805	1.6	Long- and short-term
H65	Mount Pleasant 3	631115	165852	1.6	Long- and short-term
H66	Tothill Street 2	631061	165470	1.6	Long- and short-term
H67	Proposed Manston Road 4	634597	166287	1.6	Long- and short-term
H68	Proposed Manston Green	635335	165657	1.6	Long- and short-term
H69	Proposed at Jentex site	634417	165213	1.6	Long- and short-term
H70	Proposed off Southall Close	631268	165516	1.6	Long- and short-term
S01	Air Cadets	633172	166482	1.6	Short-term only
S02	RAF Museum	633258	166471	1.6	Short-term only
S03	Memorial Museum	633351	166555	1.6	Short-term only
S04	Church	634633	165956	1.6	Short-term only
S05	St Stephens	635743	166131	1.6	Short-term only
S06	Tesco	636110	165647	1.6	Short-term only
S07	Smugglers Retreat	631121	165603	1.6	Short-term only
S08	Coop	631189	165670	1.6	Short-term only
A01	AQMA 1	628199	169135	1.6	AQMA
A02	AQMA 2	629810	168213	1.6	AQMA
A03	AQMA 3	630337	168165	1.6	AQMA
A04	AQMA 4	631554	168915	1.6	AQMA
A05	AQMA 5	632410	169167	1.6	AQMA
A06	AQMA 6	633542	169294	1.6	AQMA
A07	AQMA 7	635052	169313	1.6	AQMA
A08	AQMA 8	635998	168591	1.6	AQMA

ID	Description	Easting	Northing	Height	Notes
A09	AQMA 9	635909	167560	1.6	AQMA
A10	AQMA 10	635754	166743	1.6	AQMA
A11	AQMA 11	635574	165975	1.6	AQMA
A12	AQMA 12	635125	165203	1.6	AQMA
A13	AQMA 13	634752	165243	1.6	AQMA
A14	AQMA 14	634369	165285	1.6	AQMA
A15	AQMA 15	634356	165091	1.6	AQMA
A16	AQMA 16	634362	164473	1.6	AQMA
A17	AQMA 17	634276	164112	1.6	AQMA
A18	AQMA 18	634556	163810	1.6	AQMA
A19	AQMA 19	634834	164066	1.6	AQMA
A20	AQMA 20	635064	163939	1.6	AQMA
A21	AQMA 21	635416	164358	1.6	AQMA
A22	The Square Birchington 1	630226	169070	1.6	AQMA
A23	The Square Birchington 2	630235	169089	1.6	AQMA
A24	The Square Birchington 3	630253	169081	1.6	AQMA
A25	The Square Birchington 4	630270	169076	1.6	AQMA
A26	The Square Birchington 5	630288	169071	1.6	AQMA
A27	The Square Birchington 6	630308	169071	1.6	AQMA
A28	The Square Birchington 7	630308	169058	1.6	AQMA
A29	The Square Birchington 8	630290	169050	1.6	AQMA
A30	The Square Birchington 9	630276	169045	1.6	AQMA
A31	The Square Birchington 10	630254	169033	1.6	AQMA
A32	St Lawrence 1	637052	165324	1.6	AQMA
A33	St Lawrence 2	637046	165372	1.6	AQMA
A34	St Lawrence 3	637074	165376	1.6	AQMA
A35	St Lawrence 4	637065	165340	1.6	AQMA
A36	St Lawrence 5	637075	165331	1.6	AQMA
A37	St Lawrence 6	637104	165345	1.6	AQMA
A38	St Lawrence 7	637140	165328	1.6	AQMA
A39	St Lawrence 8	637119	165323	1.6	AQMA
A40	St Lawrence 9	637099	165327	1.6	AQMA

ID	Description	Easting	Northing	Height	Notes
A41	St Lawrence 10	637082	165319	1.6	AQMA
A42	St Lawrence 11	637085	165289	1.6	AQMA
A43	St Lawrence 12	637063	165280	1.6	AQMA

Table 6.2 Ecological receptor locations

ID	Description	Easting	Northing	Height	Notes
E01	Ramsar, SPA, SSSI	621048	168683	0	UK9012071
E02	Ramsar, SPA, SSSI	625191	169137	0	UK9012071
E03	Ramsar, SPA, SAC, SSSI	628533	169560	0	UK0013107, UK9012071
E04	Ramsar, SPA, SAC, SSSI	629867	169917	0	UK0013107, UK9012071
E05	Ramsar, SPA, SAC, SSSI	630740	169804	0	UK0013107, UK9012071
E06	Ramsar, SPA, SAC, SSSI	631813	170059	0	UK0013107, UK9012071
E07	Ramsar, SPA, SAC, SSSI	632683	170381	0	UK0013107, UK9012071
E08	Ramsar, SPA, SAC, SSSI	633993	170521	0	UK0013107, UK9012071
E09	Ramsar, SPA, SAC, SSSI	635116	170740	0	UK0013107, UK9012071
E10	Ramsar, SPA, SAC, SSSI	636457	171381	0	UK0013107, UK9012071
E11	Ramsar, SPA, SAC, SSSI	637964	171321	0	UK0013107, UK9012071
E12	Ramsar, SPA, SAC, SSSI	639028	171113	0	UK0013107, UK9012071
E13	Ramsar, SPA, SAC, SSSI	639841	170161	0	UK0013107, UK9012071
E14	Ramsar, SPA, SAC, SSSI	639882	168631	0	UK0013107, UK9012071
E15	Ramsar, SPA, SAC, SSSI	639810	167452	0	UK0013107, UK9012071
E16	Ramsar, SPA, SAC, SSSI	639527	166684	0	UK0013107, UK9012071
E17	Ramsar, SPA, SAC, SSSI	639241	165688	0	UK0013107, UK9012071
E18	SAC	638891	165003	0	UK0013107
E19	SAC	638595	164294	0	UK0013107
E20	Ramsar (30 m distant), SPA (30 m distant), SAC, SSSI, NNR	637303	164087	0	UK0013077, UK9012071
E21	Ramsar (70 m distant), SPA (70 m distant), SAC, SSSI, NNR (70 m distant)	636318	164194	0	UK0013077, UK9012071
E22	Ramsar, SPA, SAC, SSSI, NNR	635298	164386	0	UK0013077, UK9012071
E23	Ramsar, SPA, SAC, SSSI, NNR	634800	164047	0	UK0013077, UK9012071

ID	Description	Easting	Northing	Height	Notes
E24	Ramsar, SPA, SAC, SSSI, NNR	634346	163650	0	UK0013077, UK9012071
E25	Ramsar, SPA, SSSI, NNR	633796	162733	0	UK9012071
E26	Ramsar, SPA, SSSI, NNR	633703	162425	0	UK9012071
E27	Ramsar, SPA, SAC, SSSI, NNR	634513	161455	0	UK0013077, UK9012071
E28	Ramsar, SPA, SAC, SSSI	633502	161188	0	UK0013077, UK9012071
E29	Ramsar, SPA, SAC, SSSI, NNR	635337	160698	0	UK0013077, UK9012071
E30	Ramsar, SPA, SAC, SSSI	633692	159746	0	UK0013077, UK9012071
E31	SAC, SSSI	634794	159415	0	UK0013077
E32	Ramsar, SPA, SAC, SSSI, NNR	635708	159117	0	UK0013077, UK9012071
E33	SAC, SSSI	633607	158133	0	UK0013077
E34	SAC, SSSI	635539	157577	0	UK0013077
E35	Ramsar, SSSI	633584	156906	0	1001128
E36	Ramsar, SPA, SSSI	635214	156105	0	UK9012071
E37	Ramsar, SSSI	632347	155607	0	1001128
E38	SSSI	632033	163044	0	1001128
E39	SSSI	632554	162933	0	1001128
E40	SSSI	633412	162328	0	1001128
E41	SSSI	633527	162189	0	1001128
E42	SSSI	632364	162425	0	1001128
E43	Ramsar, SPA, SAC, SSSI	622112	162206	0	UK0030283, UK9012121
E44	Ramsar, SPA, SAC, SSSI, NNR	623126	162989	0	UK0030283, UK9012121
E45	SAC, SSSI, NNR	624052	162872	0	UK0030283
E46	SAC, SSSI, NNR	624096	162621	0	UK0030283
E47	SAC, SSSI, NNR	623938	162268	0	UK0030283
E48	Ramsar, SPA, SAC, SSSI	623648	161865	0	UK0030283, UK9012121
E49	Ramsar, SPA, SAC, SSSI	622879	161358	0	UK0030283, UK9012121
E50	LWS	631694	164088	0	
E51	LWS	631458	164099	0	
E52	LWS	631039	164107	0	
E53	LWS	632436	162421	0	

ID	Description	Easting	Northing	Height	Notes
E54	LWS	631908	162848	0	
E55	LWS	631008	162944	0	
E56	LWS	630479	164211	0	
E57	LWS	630389	164405	0	
E58	LWS	630172	164540	0	
E59	Habitat	633116	169430	0	
E60	Habitat	633976	168913	0	
E61	Habitat	635881	166552	0	
E62	Habitat	635634	165614	0	
E63	Habitat	635696	165271	0	
E64	Habitat	635212	165108	0	
E65	Habitat	635302	164394	0	
E66	Habitat	634825	164063	0	
E67	Habitat	634369	163647	0	
E68	Habitat	634218	163399	0	
E69	Habitat	633122	163264	0	
E70	Habitat	633581	165056	0	
E71	Habitat	633420	165112	0	
E72	Habitat	633441	164876	0	
E73	Habitat	633330	164922	0	
E74	Habitat	632062	164071	0	
E75	Habitat	631267	164655	0	
E76	Habitat	631135	164551	0	
E77	Habitat	631149	166159	0	
E78	Habitat	632034	166274	0	
E79	Habitat	632106	166329	0	
E80	Habitat	632102	166377	0	
E81	Habitat	633049	166413	0	
E82	Habitat	633119	166478	0	
E83	Habitat	632891	166706	0	
E84	Habitat	632763	166769	0	
E85	Habitat	631105	168000	0	

ID	Description	Easting	Northing	Height	Notes
E86	Habitat	631260	168095	0	
E87	Habitat	631603	168434	0	
E88	Habitat	632016	168303	0	

Table 6.2a Ecological receptors: details of designated sites

ID	Designated sites
E01	Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Thanet Coast SSSI Bishopstone Cliffs LNR
E02	Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Thanet Coast SSSI
E03–E17	Thanet Coast SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Thanet Coast SSSI
E18–E19	Thanet Coast SAC
E20–E21	Thanet Coast SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR
E22–E24	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR
E25–E26	Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR
E27	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR
E28	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI
E29	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR Prince's Beachlands LNR

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ID	Designated sites
E30	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI
E31	Sandwich Bay SAC Sandwich Bay to Hacklinge Marshes SSSI
E32	Sandwich Bay SAC Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI Sandwich & Pegwell Bay NNR
E33–E34	Sandwich Bay SAC Sandwich Bay to Hacklinge Marshes SSSI
E35	Thanet Coast & Sandwich Bay Ramsar Sandwich Bay to Hacklinge Marshes SSSI
E36	Thanet Coast & Sandwich Bay Ramsar Thanet Coast & Sandwich Bay SPA Sandwich Bay to Hacklinge Marshes SSSI
E37	Thanet Coast & Sandwich Bay Ramsar Sandwich Bay to Hacklinge Marshes SSSI
E38–E42	Sandwich Bay to Hacklinge Marshes SSSI
E43–E44	Stodmarsh SAC Stodmarsh Ramsar Stodmarsh SPA Stodmarsh SSSI
E45–E47	Stodmarsh SAC Stodmarsh SSSI
E48–E49	Stodmarsh SAC Stodmarsh Ramsar Stodmarsh SPA Stodmarsh SSSI
E50–E58	Local Wildlife Sites identified by EA (Ash Level and South Richborough Pasture, Woods and Grassland, Minster Marshes)
E59–E64	Various National Forest Inventory
E65–E68	Other protected habitats identified by EA
E69–E84	Various National Forest Inventory

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Table 6.3 Monitor receptor locations

ID	Description	Easting	Northing	Height	Notes
M01	ZH3 Thanet Airport	635931	165331	1.6	Monitor
M02	ZH4 Thanet Ramsgate	638483	165430	1.6	Monitor
M03	ZH5 Thanet Birchington	630284	169052	1.6	Monitor
M04	TH05	639019	167981	1.6	Monitor

ID	Description	Easting	Northing	Height	Notes
M05	TH10	635539	169840	1.6	Monitor
M06	TH13/46/47	630254	169037	1.6	Monitor
M07	TH16	634445	164416	1.6	Monitor
M08	TH26	638492	165410	1.6	Monitor
M09	TH27	639097	165971	1.6	Monitor
M10	TH31	634662	166026	1.6	Monitor
M11	TH32	632984	166419	1.6	Monitor
M12	TH33	631161	165486	1.6	Monitor
M13	TH34	636570	167891	1.6	Monitor
M14	TH36	636405	168227	1.6	Monitor
M15	TH37/38/45	635932	165333	1.6	Monitor
M16	TH48	630438	169111	1.6	Monitor
M17	TH49	630186	168983	1.6	Monitor
M18	TH50/61/62	638616	165564	1.6	Monitor
M19	TH51/52/53	638472	165432	1.6	Monitor
M20	TH54/64/65	637135	165354	1.6	Monitor
M21	TH55	636815	167297	1.6	Monitor
M22	TH59	638220	168614	1.6	Monitor
M23	TH66	637112	165331	1.6	Monitor
M24	TH67/68/69	638536	165465	1.6	Monitor
M25	TH70/71/72	637092	165340	1.6	Monitor
M26	TH73/74/75	638528	165426	1.6	Monitor
M27	TH76	634752	170679	1.6	Monitor

Appendix 6.2

Baseline Air Quality Data

Current Baseline

Thanet District Council Monitoring

6.1.3 Details of the continuous monitors operated by Thanet District Council (TDC) are summarised in **Table 6.4**, and details of the diffusion tubes operated by TDC are summarised in **Table 6.5**. Their locations are shown in **Figure 6.1**.

Table 6.4 Continuous monitor details

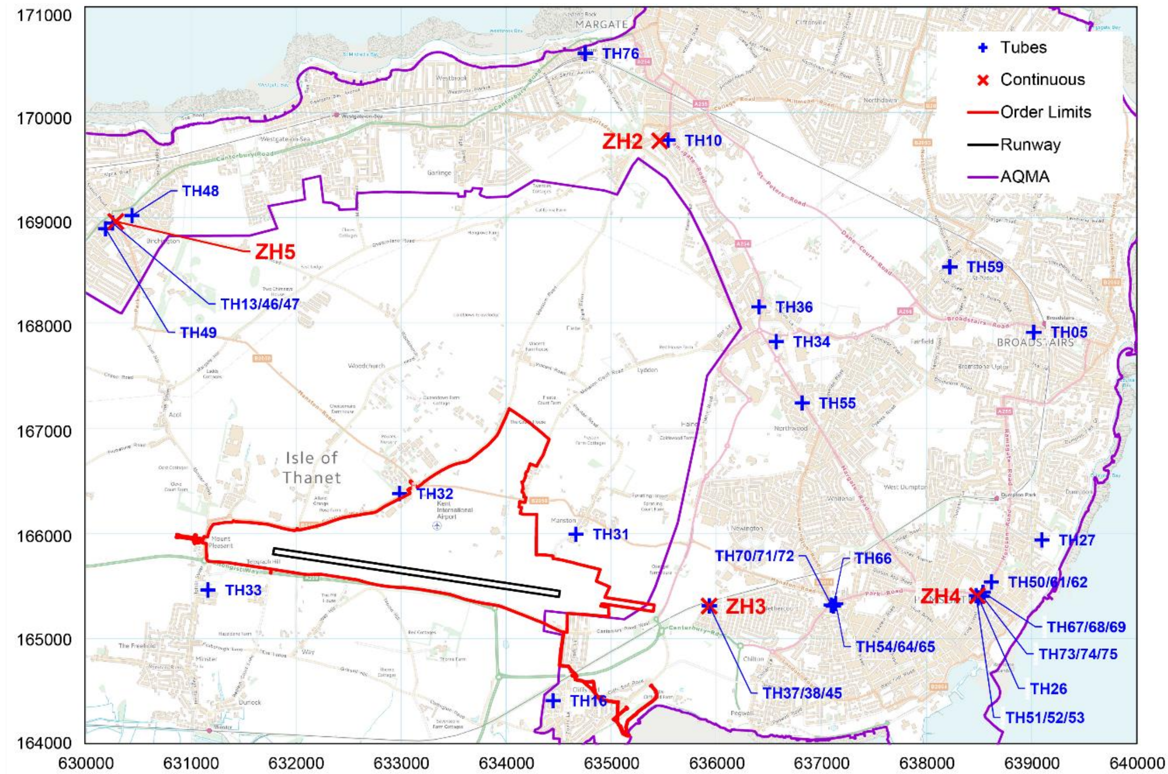
Name	National grid coordinates	Classification	Pollutants monitored	Notes
ZH2 Thanet Margate Background	635460, 169833	Urban background	NO_x (i.e. NO, NO_2)	Closed March 2013.
ZH3 Thanet Airport	635931, 165331	Suburban	NO_x (i.e. NO, NO_2)	Closed March 2016.
ZH4 Thanet Ramsgate Roadside	638483, 165430	Roadside	NO_x (i.e. NO, NO_2), PM_{10}	n/a
ZH5 Thanet Birchington Roadside	630284, 169052	Roadside	NO_x (i.e. NO, NO_2), PM_{10}	n/a

Table 6.5 Diffusion tube details

Name	National grid coordinates	Classification	Notes
TH05	639019, 167981	Kerbside	n/a
TH10	635539, 169840	Kerbside	n/a
TH13/46/47	630254, 169037	Kerbside	n/a
TH16	634445, 164416	Background	n/a
TH26	638492, 165410	Kerbside	n/a
TH27	639097, 165971	Urban background	n/a
TH31	634662, 166026	Urban background	n/a
TH32	632984, 166419	Urban background	n/a
TH33	631161, 165486	Urban background	n/a
TH34	636570, 167891	Roadside	n/a
TH36	636405, 168227	Kerbside	n/a
TH37/38/45	635932, 165333	Kerbside	n/a
TH48	630438, 169111	Kerbside	n/a

Name	National grid coordinates	Classification	Notes
TH49	630186, 168983	Roadside	n/a
TH50/61/62	638616, 165564	Roadside	n/a
TH51/52/53	638472, 165432	Roadside	n/a
TH54/64/65	637135, 165354	Roadside	n/a
TH55	636815, 167297	Roadside	n/a
TH59	638220, 168614	Kerbside	From 2015 only.
TH66	637112, 165331	Roadside	n/a
TH67/68/69	638536, 165465	Roadside	n/a
TH70/71/72	637092, 165340	Roadside	n/a
TH73/74/75	638528, 165426	Roadside	n/a
TH76	634752, 170679	Roadside	From 2015 only.

Figure 6.1 Air Quality Monitoring Locations



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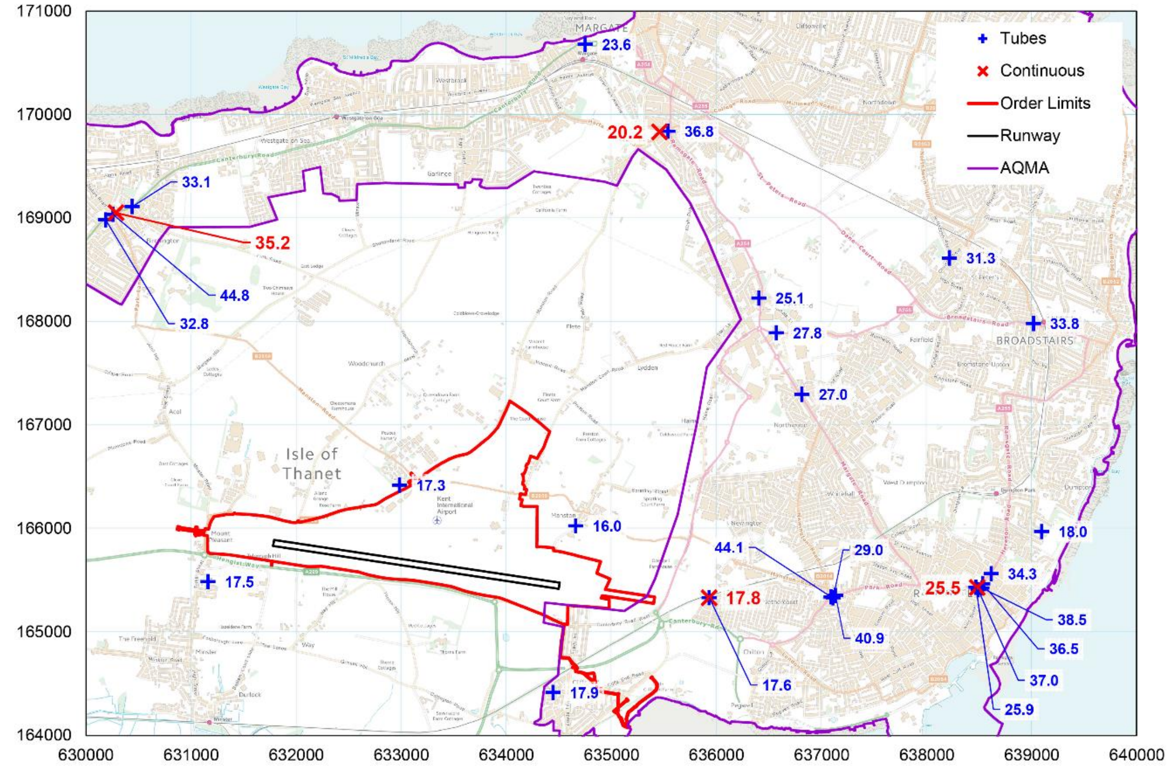
6.1.4 Measured annual mean NO_2 concentrations from Thanet's monitoring programme between 2007 and 2016 are summarised in **Table 6.6**. **Figure 6.2** shows the locations of the monitors labelled with the annual mean NO_2 concentration averaged over the available measurement years.

Table 6.6 Annual mean NO_2 concentrations (µg m^{-3}) from monitors

Name	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
ZH2	21	21	21	20	19.5	19.5*	19.3*	N/A	N/A	N/A	**20.2**
ZH3	18	19	21	18	18.7	18.1	16.0	16.5	14.7	N/A	**17.8**
ZH4	25	26	30	26	26.8	25.1	25.2	25.6	22.9	22.6	**25.5**
ZH5	37	39	40	35	35.9	40.8	34.8	30.8	24.6	33.6	**35.2**
TH05	N/A	N/A	40	31	34.4	34.7	31.2	34.8	30.3	33.6	**33.8**
TH10	N/A	N/A	43	37	40.4	35.4	33.7	35.3	34.9	35.0	**36.8**
TH13/46/47	N/A	N/A	49	41	46.6	45.1	43.0*	47.4	42.4	44.1	**44.8**
TH16	N/A	N/A	21	18	17.2	18.9	16.6	20.0	14.7	16.7	**17.9**
TH26	N/A	N/A	42	36	38.5	36.1	34.9	37.1	35.3	36.0	**37.0**
TH27	N/A	N/A	22	19	19.0	18.4	17.9	17.1	14.1	16.3	**18.0**
TH31	N/A	N/A	19	17	17.4	15.0	15.6	16.4	12.9	14.7	**16.0**
TH32	N/A	N/A	22	19	19.2	16.6	15.9	15.7	14.4	15.4	**17.3**
TH33	N/A	N/A	22	18	19.1	16.1	18.3	15.2	14.9	16.5	**17.5**
TH34	N/A	N/A	33	26	32.2	27.9	25.5	27.7	24.1	25.8	**27.8**
TH36	N/A	N/A	26	24	26.1	24.0	23.8	25.7	22.5	28.6	**25.1**
TH37/38/45	N/A	N/A	21	19	19.4	17.2	16.7	16.4	14.8	16.0	**17.6**
TH48	N/A	N/A	37	31	32.8	34.2	33.3	33.7	31.9	31.2	**33.1**
TH49	N/A	N/A	43	36	38.8	37.1	32.8	33.7	20.3	20.7	**32.8**
TH50/61/62	N/A	N/A	38	35	34.7	33.7	33.1	34.4	32.3	33.0	**34.3**
TH51/52/53	N/A	N/A	30	26	25.5	26.4	23.6	28.1	23.7	23.7	**25.9**
TH54/64/65	N/A	N/A	45	40	42.3	41.7	38.0	41.2	38.2	40.9	**40.9**
TH55	N/A	N/A	30	28	28.3	26.6	25.9	26.6	21.9	29.0	**27.0**
TH59	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	29.3	33.3	**31.3**
TH66	N/A	N/A	31	29	29.0	28.1	28.3	28.5	31.1	27.2	**29.0**
TH67/68/69	N/A	N/A	42	38	37.7	36.5	34.4	34.4	33.7	35.6	**36.5**
TH70/71/72	N/A	N/A	47	42	43.4	44.3	43.7	44.4	42.8	44.9	**44.1**
TH73/74/75	N/A	N/A	N/A	37	39.5	36.0	43.7*	42.1	35.7	35.7	**38.5**
TH76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21.6	25.5	**23.6**

*Low data capture. Data capture information is not available for 2007 – 2011.

Figure 6.2 Annual mean average NO_2 concentrations (for the available years)



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6.1.5 Measured annual mean NO_x concentrations from Thanet's monitoring programme between 2007 and 2016 are summarised in **Table 6.7**.

Table 6.7 Annual mean NO_x concentrations (µg m^{-3}) from monitors

Name	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
ZH2	32	32	29	28	26	N/A	N/A	N/A	N/A	N/A	**29.4**
ZH3	24	24	26	24	23	22	20	20	18	N/A	**22.3**
ZH4	42	42	47	41	41	41	40	41	36	38	**40.9**
ZH5	83	84	88	78	81	93	79	71	54	70	**78.1**

6.1.6 Measured annual mean PM_{10} concentrations from Thanet's monitoring programme between 2007 and 2016 are summarised in **Table 6.8**.

Table 6.8 Annual mean PM_{10} concentrations (µg m^{-3}) from monitors

Name	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
ZH4	N/A	N/A	29	28	34.0	27.6	30.7*	24.7	24.3	25.9	**28.0**
ZH5	N/A	N/A	23	24	28.8	25.4	25.6*	20.8	22.3	25.0	**24.4**

*Low data capture. Data capture information is not available for 2007 – 2011.

Defra's background mapped concentrations

6.1.7 Concentrations of NO_2, NO_x, PM_{10} and $PM_{2.5}$ from the Defra data for 2018 are given in **Table 6.9** to **Table 6.12** for a selection of 1 km Ordnance Survey grid squares in the vicinity of the airport (grid square from 629500 to 639500 eastings by 163500 to 169500 northings). Concentrations of NO_2 are shown graphically in Error! Reference source not found..

Table 6.9 Annual mean NO_2 concentrations (µg m^{-3}) by 1 km grid square from Defra data

	629500	630500	631500	632500	633500	634500	635500	636500	637500	638500	639500
169500	8.9	9.5	9.5	9.9	10.0	9.4	10.6	10.1	9.9	10.4	9.1
168500	8.8	9.0	8.4	8.7	8.6	8.7	9.3	10.9	10.5	11.1	10.2
167500	8.7	8.5	9.0	9.6	8.6	8.9	9.4	11.4	13.3	11.0	11.3
166500	8.3	8.5	11.5	9.8	9.8	9.5	10.9	11.2	11.2	10.9	10.2
165500	8.9	9.3	10.3	10.0	10.1	10.0	11.7	11.8	12.5	12.3	10.1
164500	8.0	8.5	8.5	8.4	8.9	9.4	10.2	12.0	12.1	11.2	N/A
163500	7.7	7.8	7.9	8.0	8.6	9.3	10.0	10.8	11.0	10.9	N/A

Table 6.10 Annual mean NO_x concentrations (µg m^{-3}) by 1 km grid square from Defra data

	629500	630500	631500	632500	633500	634500	635500	636500	637500	638500	639500
169500	11.9	12.8	12.8	13.4	13.6	12.7	14.4	13.7	13.4	14.1	12.3
168500	11.7	12.1	11.2	11.6	11.5	11.6	12.5	14.8	14.3	15.2	13.8
167500	11.6	11.4	12.1	13.1	11.6	11.9	12.7	15.6	18.6	15.0	15.5
166500	11.1	11.4	15.9	13.3	13.3	12.8	14.9	15.3	15.3	14.9	13.8
165500	12.0	12.5	14.0	13.5	13.7	13.6	16.0	16.2	17.3	17.0	13.7
164500	10.6	11.4	11.4	11.2	12.0	12.6	13.8	16.5	16.7	15.4	N/A
163500	10.3	10.4	10.5	10.7	11.5	12.5	13.6	14.8	15.1	15.0	N/A

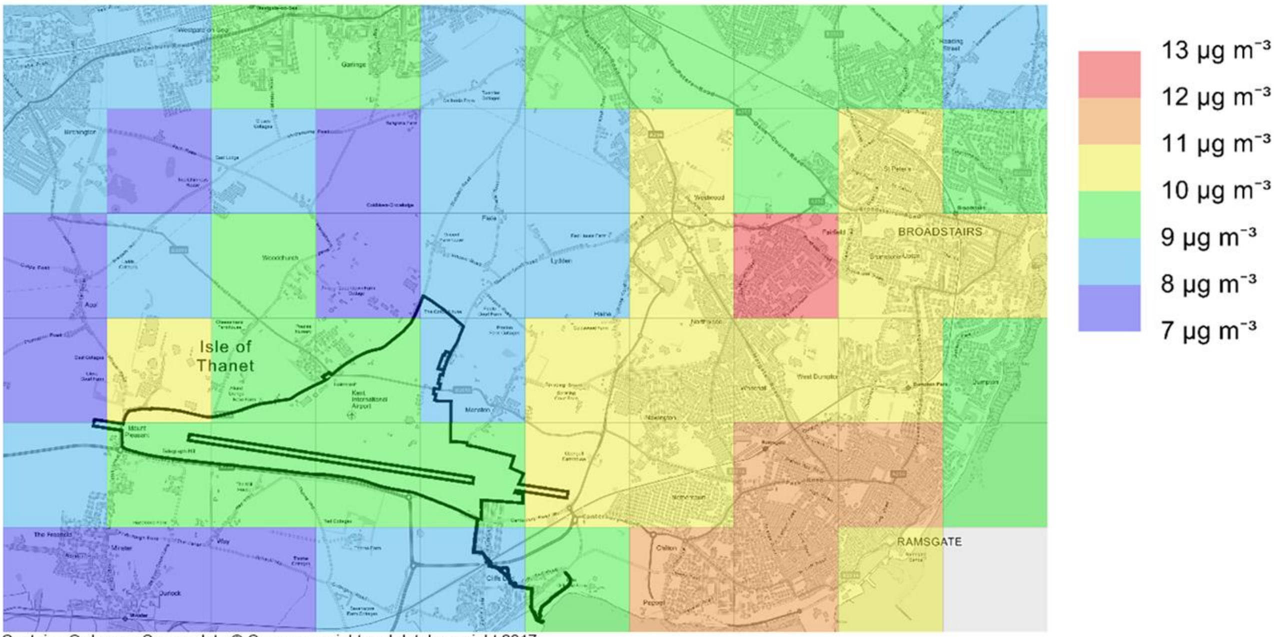
Table 6.11 Annual mean PM_{10} concentrations (µg m^{-3}) by 1 km grid square from Defra data

	629500	**630500**	**631500**	**632500**	**633500**	**634500**	**635500**	**636500**	**637500**	**638500**	**639500**
169500	14.8	14.9	15.3	15.7	15.9	15.5	15.0	15.6	15.7	15.6	14.9
168500	16.2	15.8	16.6	16.1	16.5	15.4	16.3	16.8	16.6	15.2	14.5
167500	16.9	16.5	16.8	16.7	16.0	16.4	16.8	16.4	17.0	15.2	14.9
166500	16.6	17.1	18.6	16.2	14.9	16.0	16.8	15.5	15.8	15.1	14.7
165500	17.0	16.7	17.1	16.6	16.8	15.9	17.2	15.5	15.4	15.1	13.9
164500	16.3	16.1	15.9	16.9	16.7	16.0	16.1	15.7	15.2	14.1	N/A
163500	16.1	16.4	16.8	16.5	16.3	14.7	14.1	14.0	13.9	13.7	N/A

Table 6.12 Annual mean $PM_{2.5}$ concentrations (µg m^{-3}) by 1 km grid square from Defra data

	629500	630500	631500	632500	633500	634500	635500	636500	637500	638500	639500
169500	10.6	10.6	10.8	11.1	11.2	10.9	10.8	11.0	11.1	11.1	10.6
168500	11.2	11.1	11.4	11.2	11.4	10.8	11.3	11.7	11.6	11.0	10.6
167500	11.6	11.4	11.6	11.5	11.2	11.4	11.6	11.5	11.8	10.9	10.8
166500	11.4	11.7	12.8	11.3	10.7	11.2	11.7	11.1	11.3	10.9	10.6
165500	11.6	11.5	11.8	11.5	11.6	11.2	11.8	11.1	11.1	11.0	10.2
164500	11.3	11.2	11.1	11.6	11.5	11.1	11.2	11.1	10.9	10.3	N/A
163500	11.1	11.3	11.5	11.4	11.3	10.5	10.2	10.1	10.1	10.0	N/A

Figure 6.3 Annual mean NO2 concentrations (ug m^{-3}) from Defra data



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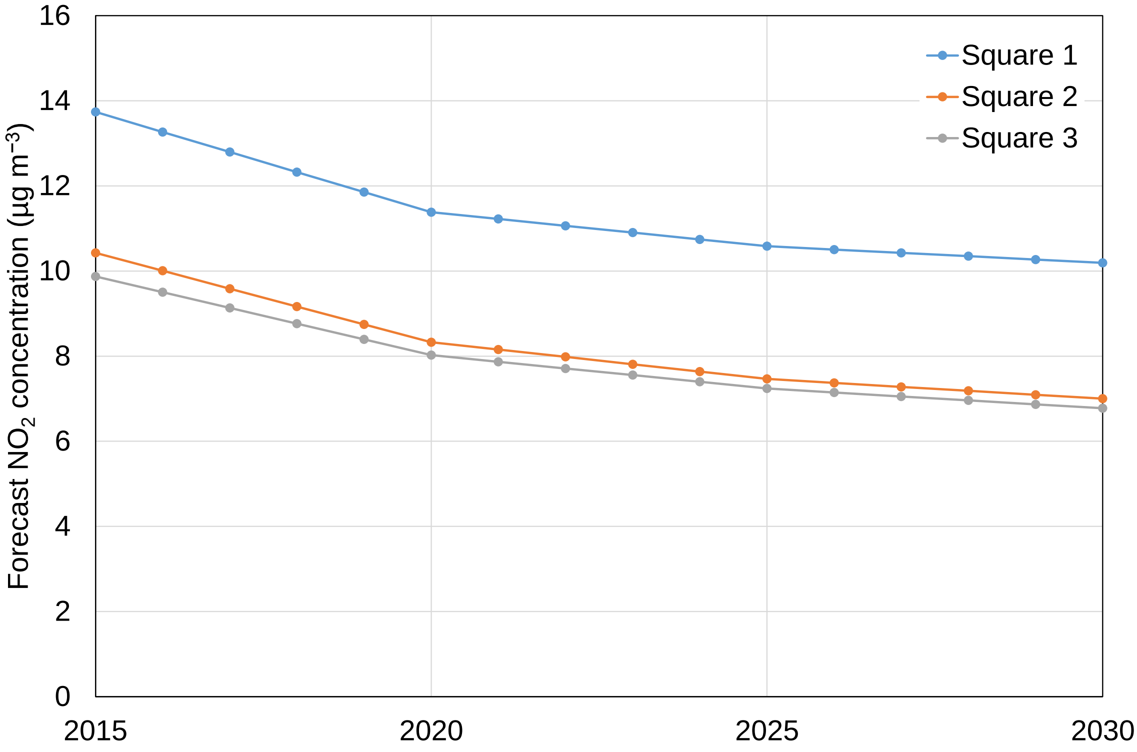
6.1.8 **Figure 6.4** shows the forecast trend in NO_2 emissions between 2013 and 2030, for three grid squares. Grid square 1 represents the square with the highest urban background concentration in 2018 (the red square in Error! Reference source not found.). Grid squares 2 and 3 represent the square containing the eastern end of the runway and the square immediately north of it; these squares contain some of the closest residential properties to the airport. It can be seen that between 2015 and 2030, annual mean background NO_2 concentrations are forecast to fall by over 3 µg m^{-3}, or between 25% and 30%. This does not take into account additional actions from Defra's new national action plan.

Figure 6.4 Trends in annual mean NO_2 concentrations ($\mu g\ m^{-3}$) from Defra data



Baseline Data Selection

6.1.9 The background concentrations in air at each of the specific receptors, as assumed in the modelling for this assessment, are given in **Table 6.13**. The background deposition rates at each of the specific ecological receptors, as assumed in the modelling for this assessment, are given in **Table 6.14**.

Table 6.13 Background air concentrations assumed for this assessment ($\mu g\ m^{-3}$)

Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$	Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$
H01	26.0	19.3	18.5	12.7	**E43**	26.0	19.3	14.8	10.5
H02	26.0	19.3	18.5	12.7	**E44**	26.0	19.3	14.1	10.0
H03	26.0	19.3	18.5	12.7	**E45**	26.0	19.3	15.8	10.9
H04	26.0	19.3	18.5	12.7	**E46**	26.0	19.3	15.8	10.9
H05	26.0	19.3	16.9	11.5	**E47**	26.0	19.3	14.1	10.0
H06	26.0	19.3	16.0	11.1	**E48**	26.0	19.3	14.7	10.3
H07	26.0	19.3	16.0	11.1	**E49**	26.0	19.3	14.3	10.2
H08	26.0	19.3	16.0	11.1	**E50**	26.0	19.3	15.7	10.9
H09	26.0	19.3	16.0	11.1	**E51**	26.0	19.3	15.7	10.9
H10	26.0	19.3	14.7	10.5	**E52**	26.0	19.3	15.7	10.9
H11	26.0	19.3	14.7	10.5	**E53**	26.0	19.3	14.8	10.4

Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$	Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$
H12	26.0	19.3	14.7	10.5	**E54**	26.0	19.3	15.2	10.6
H13	26.0	19.3	14.7	10.5	**E55**	26.0	19.3	15.2	10.6
H14	26.0	19.3	14.7	10.5	**E56**	26.0	19.3	15.8	11.0
H15	26.0	19.3	15.7	11.0	**E57**	26.0	19.3	15.8	11.0
H16	26.0	19.3	15.7	11.0	**E58**	26.0	19.3	15.8	11.0
H17	26.0	19.3	15.7	11.0	**E59**	26.0	19.3	15.7	11.0
H18	26.0	19.3	15.7	11.0	**E60**	26.0	19.3	16.3	11.2
H19	26.0	19.3	15.7	11.0	**E61**	26.0	19.3	16.6	11.5
H20	26.0	19.3	15.7	11.0	**E62**	26.0	19.3	16.9	11.6
H21	26.0	19.3	15.7	11.0	**E63**	26.0	19.3	16.9	11.6
H22	26.0	19.3	15.7	11.0	**E64**	26.0	19.3	16.9	11.6
H23	26.0	19.3	15.7	11.0	**E65**	26.0	19.3	15.9	11.0
H24	26.0	19.3	16.6	11.5	**E66**	26.0	19.3	15.7	10.9
H25	26.0	19.3	16.6	11.5	**E67**	26.0	19.3	14.5	10.3
H26	26.0	19.3	16.6	11.5	**E68**	26.0	19.3	14.5	10.3
H27	26.0	19.3	15.2	10.8	**E69**	26.0	19.3	16.1	11.1
H28	26.0	19.3	15.2	10.8	**E70**	26.0	19.3	16.5	11.4
H29	26.0	19.3	16.9	11.6	**E71**	26.0	19.3	16.5	11.4
H30	26.0	19.3	16.9	11.6	**E72**	26.0	19.3	16.5	11.3
H31	26.0	19.3	16.9	11.6	**E73**	26.0	19.3	16.5	11.3
H32	26.0	19.3	16.9	11.6	**E74**	26.0	19.3	16.7	11.4
H33	26.0	19.3	15.7	11.0	**E75**	26.0	19.3	15.7	10.9
H34	26.0	19.3	15.7	11.0	**E76**	26.0	19.3	15.7	10.9
H35	26.0	19.3	15.7	11.0	**E77**	26.0	19.3	18.5	12.7
H36	26.0	19.3	15.7	11.0	**E78**	26.0	19.3	16.0	11.1
H37	26.0	19.3	15.7	11.0	**E79**	26.0	19.3	16.0	11.1
H38	26.0	19.3	15.7	11.0	**E80**	26.0	19.3	16.0	11.1
H39	26.0	19.3	15.7	11.0	**E81**	26.0	19.3	14.7	10.5
H40	26.0	19.3	15.7	11.0	**E82**	26.0	19.3	14.7	10.5
H41	26.0	19.3	15.7	11.0	**E83**	26.0	19.3	16.0	11.1
H42	26.0	19.3	15.7	11.0	**E84**	26.0	19.3	16.0	11.1
H43	26.0	19.3	15.7	11.0	**E85**	26.0	19.3	16.4	11.2

Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$	Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$
H44	26.0	19.3	15.7	11.0	**E86**	26.0	19.3	16.4	11.2
H45	26.0	19.3	15.7	10.9	**E87**	26.0	19.3	16.4	11.2
H46	26.0	19.3	16.5	11.3	**E88**	26.0	19.3	15.9	11.0
H47	26.0	19.3	16.5	11.3	**A01**	26.0	19.3	14.3	10.1
H48	26.0	19.3	16.5	11.3	**A02**	26.0	19.3	16.0	11.0
H49	26.0	19.3	16.4	11.3	**A03**	26.0	19.3	15.5	10.9
H50	26.0	19.3	16.4	11.3	**A04**	26.0	19.3	16.4	11.2
H51	26.0	19.3	16.4	11.3	**A05**	26.0	19.3	15.4	10.9
H52	26.0	19.3	16.4	11.3	**A06**	26.0	19.3	15.7	11.0
H53	26.0	19.3	16.4	11.3	**A07**	26.0	19.3	14.7	10.6
H54	26.0	19.3	16.4	11.3	**A08**	26.0	19.3	16.0	11.1
H55	26.0	19.3	16.4	11.3	**A09**	26.0	19.3	16.5	11.4
H56	26.0	19.3	16.9	11.6	**A10**	26.0	19.3	16.6	11.5
H57	26.0	19.3	16.4	11.3	**A11**	26.0	19.3	16.9	11.6
H58	26.0	19.3	16.9	11.6	**A12**	26.0	19.3	16.9	11.6
H59	26.0	19.3	16.9	11.6	**A13**	26.0	19.3	15.7	11.0
H60	26.0	19.3	16.9	11.6	**A14**	26.0	19.3	15.7	11.0
H61	26.0	19.3	16.9	11.6	**A15**	26.0	19.3	15.7	11.0
H62	26.0	19.3	16.9	11.6	**A16**	26.0	19.3	15.7	10.9
H63	26.0	19.3	16.9	11.6	**A17**	26.0	19.3	15.7	10.9
H64	26.0	19.3	16.9	11.6	**A18**	26.0	19.3	14.5	10.3
H65	26.0	19.3	16.9	11.6	**A19**	26.0	19.3	15.7	10.9
H66	26.0	19.3	16.9	11.6	**A20**	26.0	19.3	13.9	10.0
S01	26.0	19.3	14.7	10.5	**A21**	26.0	19.3	15.9	11.0
S02	26.0	19.3	14.7	10.5	**A22**	26.0	35.3	14.6	10.4
S03	26.0	19.3	14.7	10.5	**A23**	26.0	35.3	14.6	10.4
S04	26.0	19.3	15.7	11.0	**A24**	26.0	35.3	14.6	10.4
S05	26.0	19.3	16.6	11.5	**A25**	26.0	35.3	14.6	10.4
S06	26.0	19.3	15.2	10.8	**A26**	26.0	35.3	14.6	10.4
S07	26.0	19.3	16.9	11.6	**A27**	26.0	35.3	14.6	10.4
S08	26.0	19.3	16.9	11.6	**A28**	26.0	35.3	14.6	10.4
E01	26.0	19.3	15.1	10.5	**A29**	26.0	35.3	14.6	10.4

Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$	Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$
E02	26.0	19.3	14.5	10.2	A30	26.0	35.3	14.6	10.4
E03	26.0	19.3	14.3	10.1	A31	26.0	35.3	14.6	10.4
E04	26.0	19.3	14.6	10.4	A32	26.0	38.0	15.1	10.9
E05	26.0	19.3	14.6	10.4	A33	26.0	38.0	15.1	10.9
E06	26.0	19.3	13.6	9.8	A34	26.0	38.0	15.1	10.9
E07	26.0	19.3	14.0	10.1	A35	26.0	38.0	15.1	10.9
E08	26.0	19.3	14.3	10.3	A36	26.0	38.0	15.1	10.9
E09	26.0	19.3	15.1	10.7	A37	26.0	38.0	15.1	10.9
E10	26.0	19.3	14.0	10.1	A38	26.0	38.0	15.1	10.9
E11	26.0	19.3	13.7	9.9	A39	26.0	38.0	15.1	10.9
E12	26.0	19.3	13.3	9.6	A40	26.0	38.0	15.1	10.9
E13	26.0	19.3	13.7	9.9	A41	26.0	38.0	15.1	10.9
E14	26.0	19.3	14.3	10.4	A42	26.0	38.0	15.1	10.9
E15	26.0	19.3	14.7	10.6	A43	26.0	38.0	15.1	10.9
E16	26.0	19.3	14.5	10.4	M01	26.0	19.3	16.9	11.6
E17	26.0	19.3	13.7	9.9	M02	26.0	19.3	14.9	10.7
E18	26.0	19.3	14.9	10.7	M03	26.0	19.3	14.6	10.4
E19	26.0	19.3	13.9	10.0	M04	26.0	19.3	14.7	10.6
E20	26.0	19.3	14.9	10.7	M05	26.0	19.3	14.7	10.6
E21	26.0	19.3	15.4	10.9	M06	26.0	19.3	14.6	10.4
E22	26.0	19.3	15.9	11.0	M07	26.0	19.3	15.7	10.9
E23	26.0	19.3	15.7	10.9	M08	26.0	19.3	14.9	10.7
E24	26.0	19.3	14.5	10.3	M09	26.0	19.3	13.7	9.9
E25	26.0	19.3	15.2	10.6	M10	26.0	19.3	15.7	11.0
E26	26.0	19.3	15.2	10.6	M11	26.0	19.3	16.0	11.1
E27	26.0	19.3	14.3	10.1	M12	26.0	19.3	16.9	11.6
E28	26.0	19.3	15.4	10.7	M13	26.0	19.3	16.2	11.3
E29	26.0	19.3	13.6	9.8	M14	26.0	19.3	16.6	11.5
E30	26.0	19.3	15.7	10.9	M15	26.0	19.3	16.9	11.6
E31	26.0	19.3	15.1	10.6	M16	26.0	19.3	14.6	10.4
E32	26.0	19.3	13.7	9.8	M17	26.0	19.3	15.5	10.9
E33	26.0	19.3	15.2	10.8	M18	26.0	19.3	14.9	10.7

Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$	Receptor	NO_x	NO_2	PM_{10}	$PM_{2.5}$
E34	26.0	19.3	14.3	10.1	**M19**	26.0	19.3	14.9	10.7
E35	26.0	19.3	15.3	10.7	**M20**	26.0	19.3	15.1	10.9
E36	26.0	19.3	15.2	10.6	**M21**	26.0	19.3	16.2	11.3
E37	26.0	19.3	15.6	10.9	**M22**	26.0	19.3	15.0	10.8
E38	26.0	19.3	16.3	11.2	**M23**	26.0	19.3	15.1	10.9
E39	26.0	19.3	14.8	10.4	**M24**	26.0	19.3	14.9	10.7
E40	26.0	19.3	15.2	10.6	**M25**	26.0	19.3	15.1	10.9
E41	26.0	19.3	15.2	10.6	**M26**	26.0	19.3	14.9	10.7
E42	26.0	19.3	14.8	10.4	**M27**	26.0	19.3	14.5	10.4

Table 6.14 Background deposition rates assumed for this assessment (µg m^{-3})

Receptor	N deposition (kg N ha^{-1} y^{-1})	N component of acid deposition (keq ha^{-1} y^{-1})	S component of acid deposition (keq ha^{-1} y^{-1})	Feature	Broad habitat
E01	12.60	0.90	0.20	Pluvialis apricaria [North-western Europe - breeding] - European golden plover	Montane habitats
E02	12.74	0.91	0.19	Pluvialis apricaria [North-western Europe - breeding] - European golden plover	Montane habitats
E03	12.74	0.91	0.19	Reefs	Inshore sublittoral rock
E04	12.74	0.91	0.19	Reefs	Inshore sublittoral rock
E05	13.02	0.93	0.20	Reefs	Inshore sublittoral rock
E06	10.36	0.74	0.19	Reefs	Inshore sublittoral rock
E07	10.36	0.74	0.19	Reefs	Inshore sublittoral rock
E08	10.36	0.74	0.19	Reefs	Inshore sublittoral rock
E09	10.78	0.77	0.20	Reefs	Inshore sublittoral rock
E10	10.78	0.77	0.20	Reefs	Inshore sublittoral rock
E11	10.78	0.77	0.20	Reefs	Inshore sublittoral rock
E12	10.78	0.77	0.20	Reefs	Inshore sublittoral rock

Receptor	N deposition (kg N ha^{-1} y^{-1})	N component of acid deposition (keq ha^{-1} y^{-1})	S component of acid deposition (keq ha^{-1} y^{-1})	Feature	Broad habitat
E13	10.78	0.77	0.20	Reefs	Inshore sublittoral rock
E14	13.16	0.94	0.23	Reefs	Inshore sublittoral rock
E15	13.16	0.94	0.23	Reefs	Inshore sublittoral rock
E16	13.16	0.94	0.23	Reefs	Inshore sublittoral rock
E17	13.16	0.94	0.23	Reefs	Inshore sublittoral rock
E18	13.16	0.94	0.23	Reefs	Inshore sublittoral rock
E19	10.78	0.77	0.21	Reefs	Inshore sublittoral rock
E20	10.78	0.77	0.21	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E21	10.78	0.77	0.21	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E22	10.78	0.77	0.21	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E23	13.44	0.96	0.20	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E24	13.44	0.96	0.20	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E25	13.44	0.96	0.20	Pluvialis apricaria [North-western Europe - breeding] - European golden plover	Montane habitats
E26	13.44	0.96	0.20	Pluvialis apricaria [North-western Europe - breeding] - European golden plover	Montane habitats
E27	13.44	0.96	0.20	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E28	13.44	0.96	0.20	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E29	10.78	0.77	0.21	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E30	15.68	1.12	0.25	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)

Receptor	N deposition (kg N ha^{-1} y^{-1})	N component of acid deposition (keq ha^{-1} y^{-1})	S component of acid deposition (keq ha^{-1} y^{-1})	Feature	Broad habitat
E31	15.68	1.12	0.25	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E32	12.04	0.86	0.23	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E33	15.68	1.12	0.25	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E34	12.04	0.86	0.23	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Supralittoral sediment (acidic type)
E35	15.68	1.12	0.25	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E36	12.04	0.86	0.23	Pluvialis apricaria [North-western Europe - breeding] - European golden plover	Montane habitats
E37	15.68	1.12	0.25	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E38	13.44	0.96	0.20	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E39	13.44	0.96	0.20	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E40	13.44	0.96	0.20	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E41	13.44	0.96	0.20	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E42	13.44	0.96	0.20	Feature: Pluvialis apricaria - Golden Plover	Broad Habitat: Neutral grassland
E43	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E44	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E45	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E46	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E47	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E48	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E49	14.28	1.02	0.22	Vertigo moulinsiana - Desmoulin`s whorl snail	Rivers and streams
E50	12.60	0.90	0.20	Neutral Grassland	N/A
E51	12.74	0.91	0.19	Neutral Grassland	N/A

Receptor	N deposition (kg N ha^{-1} y^{-1})	N component of acid deposition (keq ha^{-1} y^{-1})	S component of acid deposition (keq ha^{-1} y^{-1})	Feature	Broad habitat
E52	12.74	0.91	0.19	Neutral Grassland	N/A
E53	12.74	0.91	0.19	Neutral Grassland	N/A
E54	13.02	0.93	0.20	Neutral Grassland	N/A
E55	10.36	0.74	0.19	Neutral Grassland	N/A
E56	17.64	1.26	0.23	Broadleaved. Mixed and Yew Woodland	N/A
E57	17.64	1.26	0.23	Broadleaved. Mixed and Yew Woodland	N/A
E58	18.62	1.33	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E59	18.62	1.33	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E60	18.62	1.33	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E61	18.62	1.33	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E62	18.62	1.33	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E63	22.68	1.62	0.28	Broadleaved. Mixed and Yew Woodland	N/A
E64	22.68	1.62	0.28	Broadleaved. Mixed and Yew Woodland	N/A
E65	22.68	1.62	0.28	Broadleaved. Mixed and Yew Woodland	N/A
E66	22.68	1.62	0.28	Broadleaved. Mixed and Yew Woodland	N/A
E67	13.16	0.94	0.23	Neutral Grassland	N/A
E68	10.78	0.77	0.21	Neutral Grassland	N/A
E69	18.48	1.32	0.26	Broadleaved. Mixed and Yew Woodland	N/A
E70	18.48	1.32	0.26	Broadleaved. Mixed and Yew Woodland	N/A
E71	18.48	1.32	0.26	Broadleaved. Mixed and Yew Woodland	N/A
E72	22.96	1.64	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E73	22.96	1.64	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E74	22.96	1.64	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E75	22.96	1.64	0.24	Wood-Pasture & Parkland	N/A

Receptor	N deposition (kg N ha^{-1} y^{-1})	N component of acid deposition (keq ha^{-1} y^{-1})	S component of acid deposition (keq ha^{-1} y^{-1})	Feature	Broad habitat
E76	22.96	1.64	0.24	Wood-Pasture & Parkland	N/A
E77	22.96	1.64	0.24	Wood-Pasture & Parkland	N/A
E78	18.48	1.32	0.26	Wood-Pasture & Parkland	N/A
E79	25.90	1.85	0.29	Broadleaved. Mixed and Yew Woodland	N/A
E80	25.90	1.85	0.29	Broadleaved. Mixed and Yew Woodland	N/A
E81	19.32	1.38	0.27	Broadleaved. Mixed and Yew Woodland	N/A
E82	25.90	1.85	0.29	Broadleaved. Mixed and Yew Woodland	N/A
E83	19.32	1.38	0.27	Broadleaved. Mixed and Yew Woodland	N/A
E84	25.90	1.85	0.29	Wood-Pasture & Parkland	N/A
E85	19.32	1.38	0.27	Wood-Pasture & Parkland	N/A
E86	25.90	1.85	0.29	Broadleaved. Mixed and Yew Woodland	N/A
E87	22.96	1.64	0.24	Broadleaved. Mixed and Yew Woodland	N/A
E88	22.96	1.64	0.24	Wood-Pasture & Parkland	N/A

Appendix 6.3

Detailed Methodology

Methodology for Predicted Effects from Airport-Related Activity

6.1.10 There are two principal sets of recommendations for carrying out an airport air quality study. The first arises from the Project for the Sustainable Development of Heathrow (PSDH), a programme run by the DfT in about 2005 – 07, the objective of which was to develop the best practical methodology for assessing the air quality impacts of a third runway at Heathrow. This came up with a number of specific recommendations, but contains significant omissions where the best approach depends on data availability. For example, PSDH does not make any recommendations about how to determine how long aircraft spend operating in various modes as there are various potential data sources, and it is left to the analyst to use their judgement as to the best way of extracting suitable operating durations. Few of the PSDH recommendations are specific to Heathrow and the methodology can be used for other airports of comparable size with similar aircraft types.

6.1.11 The PSDH methodology was implemented by Heathrow Airport for its 2008/9 emissions inventory[1], modelling study[2] and model evaluation study[3]. The reports give a detailed description of the methodology used and form a useful reference. The model evaluation found that it gave a generally good agreement with the extensive monitoring data around Heathrow, and formed a suitable basis for evaluating the impacts of future airport developments there. Subsequent Heathrow inventories have used essentially the same methodology, with some updates where new airport-specific data has become available (e.g. for taxiing times).

6.1.12 The second methodology was published by ICAO in 2011[4]. This document deals with producing emission inventories for historic years, with very little attention paid to how inventories for future years might be produced. As such it is less directly relevant to the present work for the Proposed Development.

6.1.13 The ICAO methodology offers different levels of assessment, described as ‘simple’, ‘advanced’ and ‘sophisticated’, each requiring increasingly detailed data. The sophisticated approach generally requires detailed data on times, engine settings and so forth for each individual aircraft movement, so it is unsuitable for modelling future cases. The advanced approach is similar to the PSDH recommendations in terms of data requirements, and can generally be adapted to future cases given suitable forecast data.

6.1.14 Much of the detail of the methodology is the same or similar between PSDH and ICAO.

6.1.15 A third “standard” is the Aviation Environmental Design Tool (AEDT), promulgated by the FAA for airport air quality inventories and noise studies. Detailed documentation of the methodology used by the tool is not readily available.

6.1.16 While various research groups have suggested ways in which parts of the inventory calculation can be improved, few of these have been generally incorporated into received methodologies. One notable exception is the FOA 3a method for calculating PM_{10} emissions from smoke number emissions.

[1] B Y Underwood, C T Walker and M J Peirce, Heathrow Airport Emission Inventory 2008/9. AEAT/ENV/R/2906 Issue 1, July 2010.
[2] B Y Underwood, C T Walker and M J Peirce, Air Quality Modelling for Heathrow Airport 2008/9: Methodology. AEAT/ENV/R/2915 Issue 1, July 2010.
[3] B Y Underwood, C T Walker and M J Peirce, Air Quality Modelling for Heathrow Airport 2008/9: Results and Model Evaluation. AEAT/ENV/R/2948 Issue 1, July 2010.
[4] ICAO, Airport Air Quality Manual. Doc 9889. 2011

6.1.17 Defra issues technical guidance on air quality management[5], which is an important source of guidance on approaching common sources of air pollution. However, other than providing a screening threshold of 10 million passengers per annum or 1 million tonnes of freight, it does not provide recommendations on the technical issues of modelling air quality around large airports.

6.1.18 The methodology used in this assessment is generally consistent with the ICAO advanced and PSDH recommendations, with decisions about the best approach being led by the availability of data.

The Dispersion Model

6.1.19 The PSDH carried out a model intercomparison study to compare the use of various dispersion modelling tools for airport air quality modelling. As a result, the PSDH endorsed the use of ADMS-Airport, a version of the long-established dispersion modelling tool ADMS adapted to account for the momentum and buoyancy fluxes from jet engines. However, the use of the regular version of ADMS with suitable initial dispersion characteristics was also found to be acceptable.

6.1.20 AEDT uses AERMOD for the dispersion modelling. AERMOD was developed in the United States by the American Meteorological Society (AMS)/United States Environmental Protection Agency (USEPA) Regulatory Model Improvement Committee (AERMIC). ADMS was developed in the UK by Cambridge Environmental Research Consultants (CERC) in collaboration with the Meteorological Office, National Power and the University of Surrey. Both AERMOD and ADMS are termed 'new generation' models, parameterising stability and turbulence in the planetary boundary layer by the Monin-Obukhov length and the boundary layer depth. This approach allows the vertical structure of the planetary boundary layer to be more accurately defined than by the stability classification methods of earlier dispersion models such as R91 or ISC.

6.1.21 Numerous model inter-comparison studies have demonstrated little difference between the output of ADMS and AERMOD, except in certain complex terrain scenarios. The principal difference between ADMS and ADMS-Airport is the jet engine module, which tends to reduce modelled ground-level concentrations from aircraft engines, especially at high thrust settings, as a result of the heat of the plume.

6.1.22 Taking the above into consideration, ADMS (Version 5.2) has been selected as the most appropriate model to use for the purposes of this particular study.

Emissions Sources: Aircraft Emissions

Aircraft Activity

6.1.23 The number of aircraft movements each year is taken from the fleet forecast provided by RSP. This gives the number of movements for each cargo and passenger aircraft type over the course of a year, for each year up to Year 20. These movements are summarised in **Table 6.15**.

6.1.24 In addition, estimates of light aircraft movements associated with the proposed flying school and other light aircraft operations have been provided. These make a very small contribution to air quality impacts, despite the relatively large number of movements, so it has been possible to make some simplifying assumptions without materially affecting the conclusions of the assessment. It is assumed that the training flights will be Piper PA28 aircraft, with each flight having 6 touch-and-goes - treated as seven arrivals and seven departures per training flight. There are assumed to be 3,000 such flights per year. It is assumed that other light aircraft operations will amount to 1,000 flights (2,000 movements) per year of the Piper PA34 as a representative aircraft type.

[5] Defra et al, Local Air Quality Management Technical Guidance (TG16), April 2016.

Table 6.15 Number of movements for Years 2, 6 and 20

Aircraft type	Aircraft description	Type	Year 2	Year 6	Year 20
320	A320	Cargo	10	10	15
332	A330-200	Cargo	156	390	2925
73H	B737-800 pax	Cargo	312	520	770
73Y	B737-300 freighter	Cargo	104	416	2309
744	B747-400	Cargo	220	220	0
748	B747-800	Cargo	208	312	787
752	B757-200	Cargo	624	1352	2001
76V	B767	Cargo	520	0	0
76Y	B767-300 freighter	Cargo	624	1352	0
77X	B777-200 freighter	Cargo	936	2500	3700
A4F	Antonov An-124 Ruslan	Cargo	52	130	308
AT7	ATR 72	Cargo	1456	2912	4310
C17	C-17 Globemaster	Cargo	15	15	22
LOH	Lockheed L-182 / 282 / 382 (L-100) Hercules	Cargo	15	15	22
320	A320	Pax	0	120	178
73H	B737-800 pax	Pax	0	5074	7511
753	B757-300	Pax	0	52	154
F70	Fokker 70	Pax	0	1456	1456
PA28	Piper PA28	Pax	36000	36000	36000
PA34	Piper PA34	Pax	2000	2000	2000

Main Engine Emissions: Engine Assignments

6.1.25 For each aircraft type in the fleet data, a single engine was assigned, and a single entry (identified by UID or unique identifier) in the ICAO databank or FOI database (see below) was chosen. Engine models were based on the most commonly fitted engines in the current worldwide fleet, with operator-specific information used where available. Where an engine model has more than one entry in the ICAO databank with significantly different emission factors, an entry was chosen with a test date in the mid-1990s where available; this reflects the typical age of aircraft in the cargo fleet and is conservative.

6.1.26 For the A320, the global fleet is divided approximately equally between the CFM CFM56-5B4 and the IAE V2527-A5, with the former having a slightly greater market share. However, the CFM56-5B4 has evolved significantly over the years, making it hard to choose a suitable ICAO entry. Instead, the V2527-A5 has been assumed, since this engine represents a substantial minority of the fleet and has NO_x emissions at the higher end of the CFM56-5B4 range, and is therefore conservative.

6.1.27 The aircraft engine assignments are summarised in **Table 6.16**. The UID is the engine identifier used in the ICAO emissions databank. MTOW is maximum take-off weight, used in the calculation of brake and tyre wear.

Table 6.16 Aircraft Data

Aircraft type	Aircraft description	MTOW (kg)	Number of engines	UID	Engine description
320	A320	77,000	2	1IA003	V2527-A5
332	A330-200	233,000	2	3RR030	Trent 772
73H	B737-800 pax	70,533	2	8CM064	CFM56-7B24/3
73Y	B737-300 freighter	63,276	2	1CM005	CFM56-3B-2
744	B747-400	396,893	4	2GE045	CF6-80C2B1F
748	B747-800	442,252	4	11GE139	GEnx-2B67
752	B757-200	113,400	2	1RR012	RB211-535C
753	B757-300	122,470	2	1RR012	RB211-535C
76V	B767	185,065	2	2GE044	CF6-80C2B6
76Y	B767-300 freighter	185,065	2	2GE044	CF6-80C2B6
77X	B777-200 freighter	347,451	2	7GE097	GE90-110B1
A4F	Antonov An-124 Ruslan	391,994	4	1GE006	CF6-50C
AT7	ATR 72	22,000	2	PW127	PW127
C17	C-17 Globemaster	265,350	4	4PW073	PW2040
F70	Fokker 70	38,100	2	1RR020	TAY Mk620-15
LOH	Lockheed L-182 / 282 / 382 (L-100) Hercules	70,306	4	T56-A-15	T56-A-15
PA28	Piper PA28	975	1	IO-320-DIAD	IO-320-DIAD
PA34	Piper PA34	2,155	2	IO-360-B	IO-360-B

Main Engine Emissions: Emission Factors

6.1.28 Emission factors for jet engines are taken from the ICAO databank, version 23[6]. The databank provides emission indices for NO_x, CO and HC, fuel flow rates and smoke numbers; each of these is given at four power settings (100%, 85%, 30% and 7% of rated thrust). Emission indices are multiplied by fuel flow rates to obtain an emission factor in g s^{-1}.

6.1.29 The ICAO databank gives smoke numbers which need to be converted to emission indices. This is done using the FOA3a method[7], with the amendment that the factor of (1 − bypass ratio) in

[6] ICAO Aircraft Engine Emissions Databank, version 23. https://www.easa.europa.eu/document-library/icao-aircraft-engine-emissions-databank

[7] J Kinsey and R L Wayson, Appendix C PM methodology discussion paper. In: G Ratliff *et al.*, Aircraft Impacts on Local and Regional Air Quality in the United States. PARTNER Project 15 final report. PARTNER-COE-2009-002, October 2009.

equation 7a is only applied to mixed turbofan engines[8]. For some engines, smoke number data points at certain thrust settings are missing, so an approach originally developed by Qinetiq has been used in which factors are applied to the maximum smoke number[8].

6.1.30 For turboprop engines, emission factors are taken from the Swedish FOI database[9].

Main Engine Emissions: Times in Mode

6.1.31 In the absence of airport-specific data or detailed modelling on times in mode, the following assumptions have been made. It is assumed that times in mode are independent of aircraft type. It is also assumed that any dependence on time of day or time of year (e.g. congestion during busy periods resulting in increased taxi or hold times) is negligible. These times are considered to be realistic best estimates, rather than being intentionally conservative.

6.1.32 Taxiing speeds are assumed to be 4.1 m s^{-1} (8 knots) on average. This is based on a maximum airfield speed limit of 20 knots, with allowance for slowing down at bends and taxi hold points. Taxiing times have been calculated by dividing taxi route distances by this average speed. An additional 30 seconds has been added to taxi-in times to account for time spent attaching ground power on arrival at the stand. Other times are given in **Table 6.17**, based on Heathrow data[8]. By design, aircraft of the types proposed for Manston have very similar times for take-off, climb, approach and landing. These are tightly constrained to be uniform in order to manage and optimise separation distances, so there is very little variation in these times between airports or between (large) aircraft.

6.1.33 These times are not necessarily accurate for light aircraft such as the Piper PA28 and PA34, but in view of the very small contribution these aircraft make to total air quality emissions, the same times have been used for simplicity.

Table 6.17 Times in mode

Mode	Time in mode (s)	Notes
Pushback	600	Estimate from RSP.
Taxi-out	See text	
Hold	60	Estimate based on 20% of departing aircraft holding for 5 minutes, with the remaining aircraft being able to join the runway immediately.
Take-off roll	35	Based on Heathrow data[8].
Initial climb	30	Based on Heathrow data[8].
Climb-out	70	Based on Heathrow data[8].
Approach	230	Based on Heathrow data[8].
Landing roll — idle thrust	60	Based on Heathrow data[8]. At 7% engine thrust.
Landing roll — reverse thrust	30	Based on Heathrow data[8]. At 30% engine thrust. Used by 20% of arriving aircraft.
Taxi-in	See text	

[8] B Underwood, C Walker and M Peirce, Heathrow Airport Emission Inventory 2008/9. AEAT/ENV/R/2906/Issue 1, July 2010.
[9] Aircraft Engine Emissions Database. Available on request from http://www.foi.se/en/Our-Knowledge/Aeronautics/FOIs-Confidential-database-for-Turboprop-Engine-Emissions/.

Main Engine Emissions: Thrust Settings

6.1.34 In the absence of airport-specific data, the ICAO standard thrust settings have been used for each mode: take-off roll and initial climb at 100%, climb-out at 85%, approach at 30% and other modes at 7%.

6.1.35 It is common for aircraft to take off at less than 100% thrust, sometimes as low as 75%, primarily to reduce wear on the engines. This can reduce total NO_x emissions by as much as 25% relative to full thrust take-offs. However, in the absence of airport-specific information, especially regarding issues such as load factors which can affect the take-off thrust setting chosen, a conservative assumption has been adopted that all aircraft take off at 100% thrust.

6.1.36 Aircraft sometimes use reverse thrust on landing, usually where the runway is short and/or when weather conditions are poor (e.g. wet or icy). For this assessment, it is assumed that 20% of arriving aircraft use reverse thrust on landing, for 30 seconds per landing, at an engine thrust setting of 30%.

Auxiliary Power Units (APU) Emissions

6.1.37 As well as their main engines, many aircraft have APUs which are small engines used to generate electrical power for purposes such as starting the main engines, powering air conditioning and other services. However, it is proposed that at Manston Airport the preferred source of power for these purposes is Fixed Electrical Ground Power (FEGP), which is zero-emission at point of use. It is estimated that all cargo aircraft and 50% of passenger aircraft will use FEGP and not use APUs at all. APU emissions from the remaining passenger aircraft are calculated as follows.

6.1.38 The ICAO advanced methodology provides emission factors for different aircraft size and age groups and three APU operating modes, along with typical operating times for each operating mode. These have been used to calculate emissions per arrival and per departure. For PM, ICAO does not provide emission factors as $g\ s^{-1}$ but recommend their simple methodology, which consists of a simple factor of 25 g per movement for narrow-bodied aircraft and 40 g per movement for wide-bodied aircraft.

6.1.39 The ICAO methodology suggests a total APU running time of 25 minutes per arrival–departure cycle. This agrees well with independent estimates provided by RSP, so this time has been used in the assessment.

Brake and Tyre Wear Emissions

6.1.40 Emissions of PM from brake and tyre wear are calculated using the PSDH methodology (ICAO omits this source). Brake wear emissions, in g PM_{10} per arrival, are calculated as $2.53 \times 10^{-4} \times$ MTOW, where MTOW is the maximum take-off weight in kg. Tyre wear emissions, in g PM_{10} per arrival, are calculated as $2.23 \times 10^{-3} \times \text{MTOW} - 87.4$ for aircraft with an MTOW > 50,000 kg, and $24.1 \times \text{MTOW} / 50000$ for smaller aircraft.

6.1.41 $PM_{2.5}$ emissions are calculated by multiplying the PM_{10} emission by 0.4 for brake wear and 0.7 for tyre wear.

Aircraft Emissions: Spatial Disaggregation

6.1.42 Aircraft emissions are treated as volume sources with an initial vertical extent of 20 m. Stand-based emissions (pushback and APUs) are assigned to polygons covering the cargo and passenger apron areas. Taxiway- and runway-based emissions are treated as long boxes with a width of 50 m and a length dependent on the mode.

6.1.43 Large aircraft typically require about 1500–2000 m of runway for their landing roll. It is therefore assumed that cargo aircraft, which are typically Code E (e.g. Boeing 747 or 777), use the full length of the runway from the touchdown point (approximately 2300 m) for their landing roll. Passenger aircraft, which at the Proposed Development will mainly be Code C (e.g. Boeing 737 or Airbus 320), can manage shorter rolls, so it is assumed that when landing on Runway 10, passenger aircraft exit the runway at the intersection taxiway approximately three-quarters of the way along the runway (approximately 1630 m from the touchdown point). There is no equivalent taxiway at the other end of the runway, so it is assumed that passenger aircraft landing on Runway 28 use the full length of the runway and exit at the end.

6.1.44 Taxi routes are assumed to be the most direct route between the apron and the runway. The cargo and passenger aprons are each small and simple enough that it is reasonable to assume a single point in the centre of the respective aprons as the end point of all taxiing activity. Taxi-in routes are the reverse of taxi-out routes. Each taxi route is divided into straight-line sections, and a volume source has been built around each straight-line section, of vertical extent 20 m, width 50 m, and length equal to the straight-line length.

6.1.45 It is assumed that there is at most one aircraft in the hold area at any time, so the hold queues have been assumed to be 70 m long. The hold emissions are assumed to occur in a rectangular box of this length, and 50 m wide.

6.1.46 It is assumed that cargo aircraft require 2000 m for the take-off roll and passenger aircraft require 1500 m. When departing on Runway 10, all aircraft start 50 m from the end of the runway (to allow for aircraft straightening up when joining the runway). When departing on Runway 28, cargo aircraft start 50 m from the end of the runway, while passenger aircraft are assumed to start just after the intersection taxiway about a quarter of the way along the runway. The roll is divided into ten volume sources, each 200 m (cargo) or 150 m (passenger) long, 50 m wide and 20 m in vertical extent. The departing aircraft is assumed to accelerate at a constant rate, and the emissions are partitioned between the ten volume sources accordingly (so about 32% of the emissions are assigned to the first volume source).

6.1.47 The PSDH recommended a more elaborate methodology for take-off roll, accounting for non-uniform acceleration, effects of the forward speed on the engine thrust, etc. It found that these made a difference of a few percent at most to emissions. Unfortunately, the data that underlie these methodologies were not published and remain proprietary. In view of the small difference that these effects make to emissions, they have been omitted from this assessment.

6.1.48 Initial climb is assumed to start where the take-off roll ends. Aircraft are assumed to climb at an angle of 10° to a height of 457 m (1500 feet) at constant speed. The constant speed assumption is conservative, since in reality, the continuing acceleration of the aircraft means a greater proportion of the emissions will occur at a greater height. ADMS is unable to model inclined sources, so the initial climb phase is again divided into ten volume sources, each of length 259 m (= 457 / tan(10°) / 10). The bottom of the first volume source is assumed to be at ground level, with successive volume sources 45.7 m higher. This tends to put the emissions closer to the ground than in reality, so is a conservative assumption.

6.1.49 The climb-out phase is treated similarly, and is assumed to start where the initial climb ends. Aircraft are assumed to climb at the same angle from a height of 457 m to 914 m (3000 feet) at constant speed. Again, the climb-out is divided into ten volume sources, each of length 259 m.

6.1.50 The approach phase is treated similarly. Approach is assumed to start at a height of 914 m above the runway and to finish at the runway touchdown point, with aircraft descending at a constant speed and a constant angle of 3°. The approach is divided into a number of volume sources; to reduce the number of these, the approach length is divided into ten equal sections of 150 m horizontal (7.86 vertical) plus ten equal sections of 1594 m horizontal (83.5 m vertical). It should be noted that emissions from approaching aircraft more than a few tens of metres above the ground make very little contribution to ground-level concentrations.

6.1.51 The landing roll is assumed to extend from the touchdown point to the end of the runway, and is divided into ten volume sources of length 232 m each. Uniform deceleration is assumed, and emissions are assigned to the volume sources accordingly, in the same way as for the take-off roll.

6.1.52 Brake wear emissions are assigned to the length of the runway from touchdown to runway end, and uniform along that length (it is assumed that a higher brake wear emission rate at the start of the landing roll will cancel out the reduced dwell time). Tyre wear emissions are assigned to a single volume source of length 200 m centred on the touchdown point.

6.1.53 Schematics of the disaggregation are given in **Figure 6.5** to **Figure 6.8**.

Figure 6.5 Schematic of emission disaggregation for approach

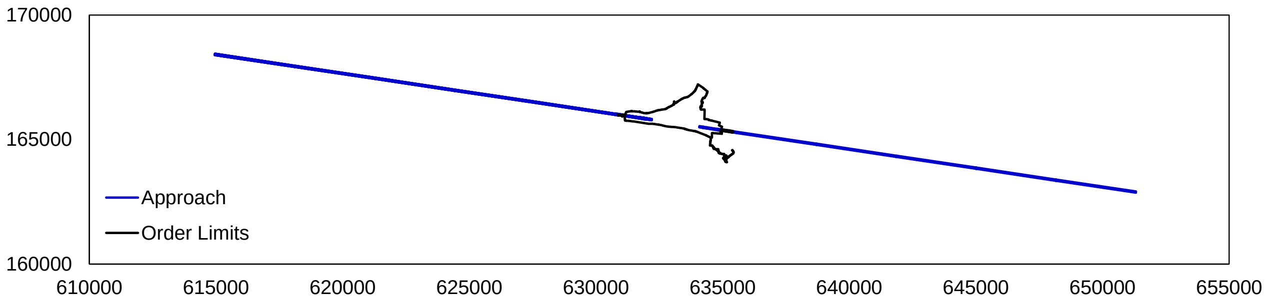


Figure 6.6 Schematic of emission disaggregation for initial climb and climb-out

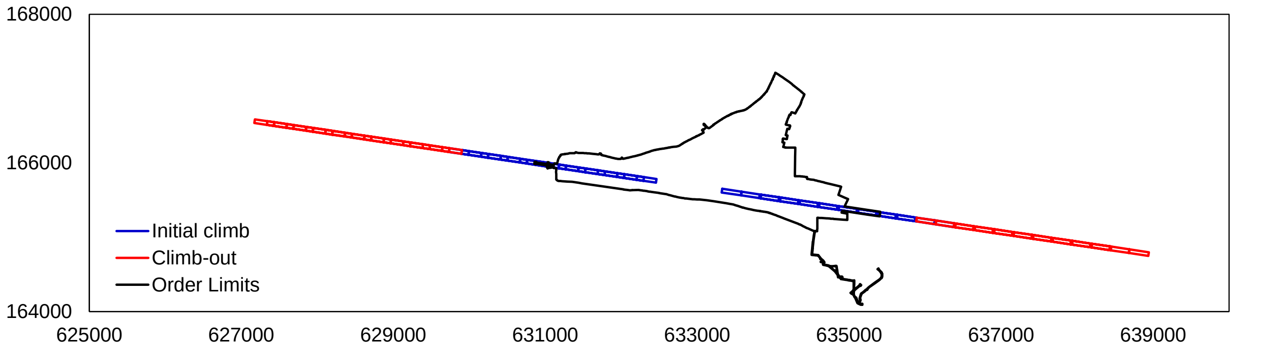


Figure 6.7 Schematic of emission disaggregation for taxiing, hold, take-off roll, pushback and APU

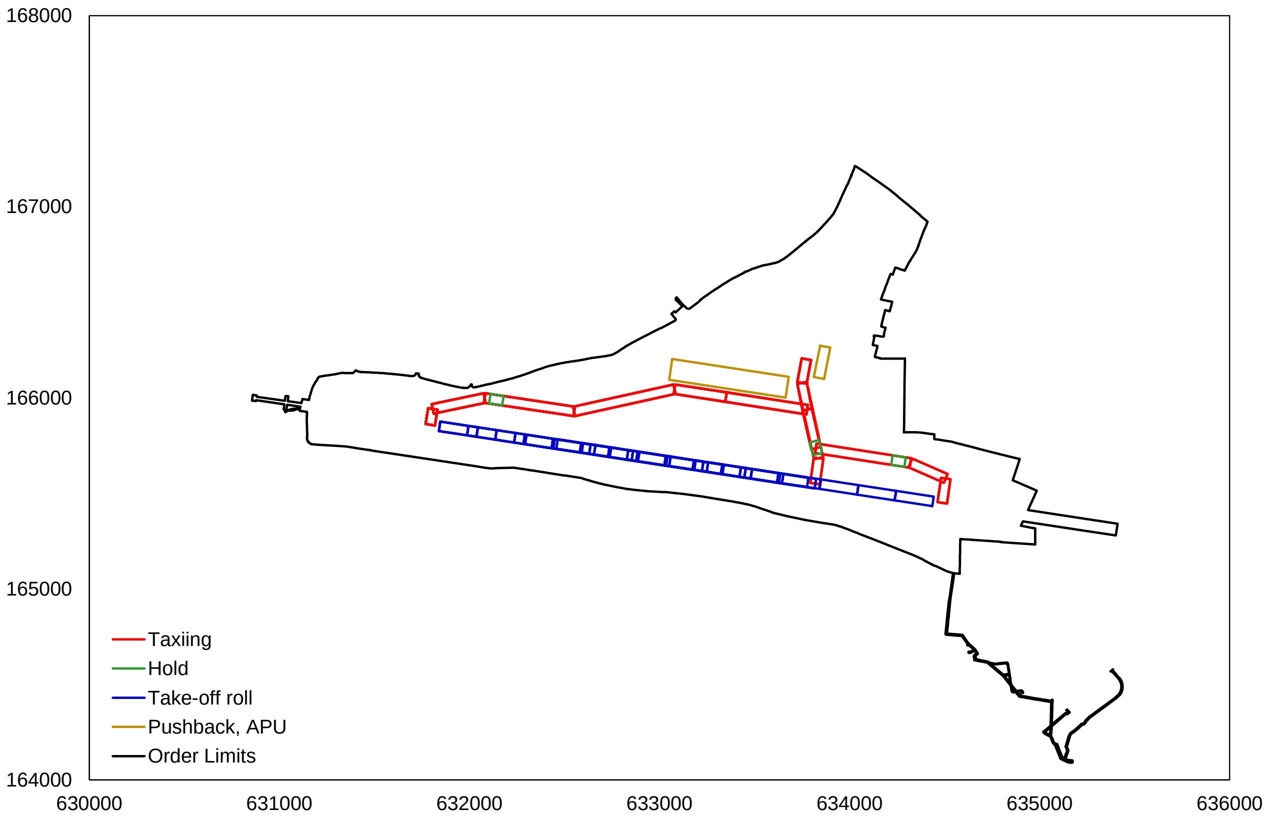
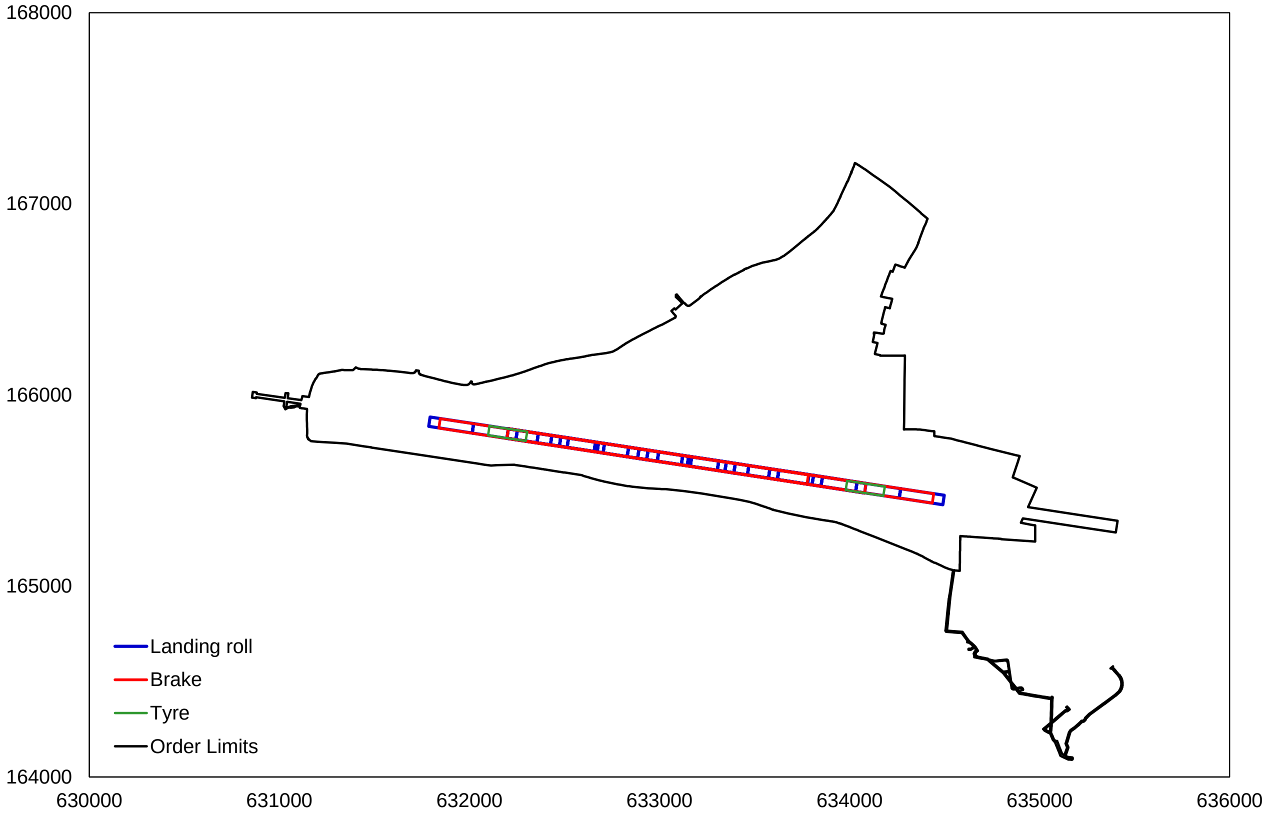


Figure 6.8 Schematic of emission disaggregation for landing roll, brake wear and tyre wear



Aircraft Emissions: Runway Assignments

6.1.54 Manston Airport has a single runway but it can be used in two directions, with aircraft moving along it either roughly eastwards (referred to as Runway 10) or westwards (Runway 28). In general, the choice of runway direction is determined by the weather, with both arriving and departing aircraft heading into the wind.

6.1.55 For the present modelling, therefore, ADMS was configured so that emissions sources for Runway 10 operations (including associated taxiing, but not apron-based sources such as pushback and APUs) are only modelled when the wind is in the direction range 9–188°, and sources for Runway 28 operations are only modelled when the wind is in the direction range 189–8° (angles are clockwise from north, directions the wind is blowing from).

6.1.56 This is an approximation, since aircraft can typically operate with a small tailwind, and may be requested to do so to avoid the operational difficulties associated with changing runway direction too frequently. No information is available on how frequent such operations are likely to be at the Proposed Development. Since tailwinds tend to blow emissions onto the airfield rather than towards sensitive receptors, this approximation is generally conservative.

Aircraft Emissions: Temporal Variation

6.1.57 Without actual operational experience of the Proposed Development, it is difficult to assign movements to particular times of day, except for noise-related constraints on night activity. Therefore, no temporal variation has been included in the modelling.

6.1.58 This assumption will overestimate the emissions occurring during the night, since while there will be some night flights, they will be less frequent than during the daytime. This assumption is generally conservative, since concentrations tend to be higher during the night due to the greater frequency of stable weather conditions which tends to reduce dispersion.

6.1.59 Similarly, it is assumed that there will be no variation in activity over the course of the year. In reality, it is likely that passenger movements may be somewhat higher in the summer than the winter, but it is doubtful that there will be any significant seasonal difference in cargo movements. Heathrow Airport shows a small increase in movements over the summer months compared to the winter. Modelling work as part of its submission to the Airports Commission[10] found that assuming a flat seasonal profile slightly overestimates modelled concentrations. This assumption is therefore considered to be conservative.

Aircraft Testing Ground Runs

6.1.60 A small number of aircraft engine ground runs will be needed as part of routine maintenance. It is estimated that there may be up to 50 of these per year, lasting about 10 minutes each at 25% engine thrust. The runs will be carried out at the western end of the runway.

6.1.61 For modelling, it has been assumed that the whole aircraft fleet are equally likely to require testing runs, and the emissions calculated accordingly. Emissions are modelled as a 50 m × 50 m × 20 m volume source.

Aircraft Maintenance Operations

6.1.62 Other than emissions from engine ground testing runs (described above), no significant source of air quality emissions from maintenance emissions have been identified.

[10] B Y Underwood, C T Walker and M J Peirce, Air Quality Modelling for Heathrow Airport 2008/9: Methodology. AEAT/ENV/R/2915 Issue 1, July 2010.

Emissions S: On-airport, Non-aircraft Emissions

Ground Support Equipment (GSE)

6.1.63 Ground support equipment (GSE) is the term for the various vehicles and items of plant and equipment used airside, such as tugs and loading platforms. GSE is normally a mix of road vehicles and non-road mobile machinery. It is intended that the GSE at Manston Airport be bought new, with an increasing proportion of the GSE fleet moving to electric units over time.

6.1.64 By Year 20, it is intended that the whole GSE fleet will be electric, apart from a small number of plant items (fire trucks, ground power units). Emissions from these units have therefore been calculated based on expected power ratings and operational hours for the diesel-powered plant items, and emission factors corresponding to Stage IV limits for non-road mobile machinery[11].

6.1.65 For Years 2 and 6, it is assumed that only a small proportion of the GSE fleet is electric. In view of the wide variety of GSE types, a bottom-up calculation of emissions would be very uncertain. Instead, emissions have been calculated by taking emissions from GSE at Heathrow in 2013[12] and scaling by aircraft activity at the two airports. Here, the measure of aircraft activity is the total maximum take-off weight (MTOW) of all movements over the course of the year.

6.1.66 For dispersion modelling, GSE emissions have been spread over polygons representing the cargo and passenger aprons, in the same way as pushback and APU emissions (see **Figure 6.7**).

Emergency Diesel Generators

6.1.67 The airport will need emergency diesel generators to cover the event of a loss of offsite electrical power. It is expected that six generators averaging 180 kW electrical output each will be required. To ensure the availability of the generators on demand, it is normal to conduct monthly runs of about 1 hour each.

6.1.68 These test runs have been included in the model. The exact specifications of the generators have not yet been defined, so emission rates for typical diesel generators have been used. The locations and stack details are also undefined at this stage, so for dispersion modelling they have been located around the airport buildings and, for conservatism, treated as ground-level volume sources. The contribution of these is small so these approximations will not materially affect the results of the assessment.

Fire Training

6.1.69 There will be no fire training activities involving combustion on the airport. The Defence Fire Training and Development Centre is a separate facility and not part of this application; any emissions from this source are included as part of the background concentrations.

Emissions Sources: Construction Activities

6.1.70 Forecasts of the number of construction vehicles and plant required for four phases of construction activity have been provided. The four phases partly overlap with the operational period of the airport, and are summarised as follows:

- Phase 1. Construction of runway, taxiways, initial cargo stands etc. Runs from Q3 2019 to Q4 2020, ending before opening of the airport in Year 2.

[11] Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.

[12] H Peace, C Walker, M Peirce (2015) Heathrow Airport 2013 Air Quality Assessment. Ricardo-AEA/R/3438 Issue Number 1.

- Phase 2: Construction of further cargo stands and infrastructure. Runs from Q4 2020 to 2023, coinciding with operational activity in Year 2 to Year 5.
- Phase 3: Construction of further cargo stands and infrastructure. Runs from 2023 to 2030, coinciding with operational activity in Year 5 to Year 12.
- Phase 4: Construction of further cargo stands and infrastructure. Runs from 2030 to 2036, coinciding with operational activity in Year 12 to Year 18.

6.1.71 As indicated above, phases 2 – 4 are expected to be spread over several years each. However, for the purposes of modelling, it has been assumed that all construction activity for a phase is compressed into a single year.

6.1.72 At this stage in project development, it is not possible to define the exact power ratings required for each plant type, so standard power ratings were obtained from BS 5228-1:2009[13], to be consistent with noise modelling. These power ratings are generally consistent with those expected for construction projects of this kind.

6.1.73 Emission rates were then calculated by multiplying the power rating for each plant item by an emission factor taken from the European directive on non-road mobile machinery[14]. This directive imposes maximum emission factors for non-road mobile machinery (including construction plant of the kind used here) depending on their power rating and date of production. For Phase 1 and Phase 2, it is assumed that all plant is manufactured after 2013 and therefore meets Stage IIIB standards; the use of Stage IV plant In Phases 1 – 2 has also been assessed as a possible mitigation measure. For Phase 3 and Phase 4, it is assumed that all plant is manufactured after 2014 (i.e. is no more than 10 years old) and therefore meets Stage IV standards.

6.1.74 It is conservatively assumed that all plant operates at full power for the full duration of their shift, from 07:00 – 17:00 weekdays and 07:00 – 12:00 Saturdays.

6.1.75 Emissions were assigned to polygonal regions of the airport according to the activity of each plant item. For example, asphalt-laying plant were assigned to a rectangular region covering the runway.

Emissions Sources: Road Traffic Emissions

Calculation of Emissions

6.1.76 As part of the traffic and transport modelling, forecasts of road traffic were generated. These forecasts provide the number of traffic movements on selected road links near the airport for future years, both with and without the Proposed Development. Movements are provided as two-way 24-hour annual average weekday traffic (AAWT), for light duty vehicles (LDV; cars and light vans) and heavy-duty vehicles (HDVs).

6.1.77 Emissions and concentrations are calculated using the recommended Defra methodology, but with emission factors uplifted using CURED. Emissions of PM_{10} and $PM_{2.5}$ were calculated using emission factors from the Emission Factor Toolkit (EFT) v7.0 for two vehicle categories, using the emissions calculator built into ADMS-Roads (a version of ADMS adapted for use in road traffic modelling). Emissions of NO_x were calculated using the Calculator Using Realistic Emissions For Diesels (CURED) v2A, created by Air Quality Consultants[15]; this includes an uplift to the Defra emission factors for diesel cars based on real-world measurements.

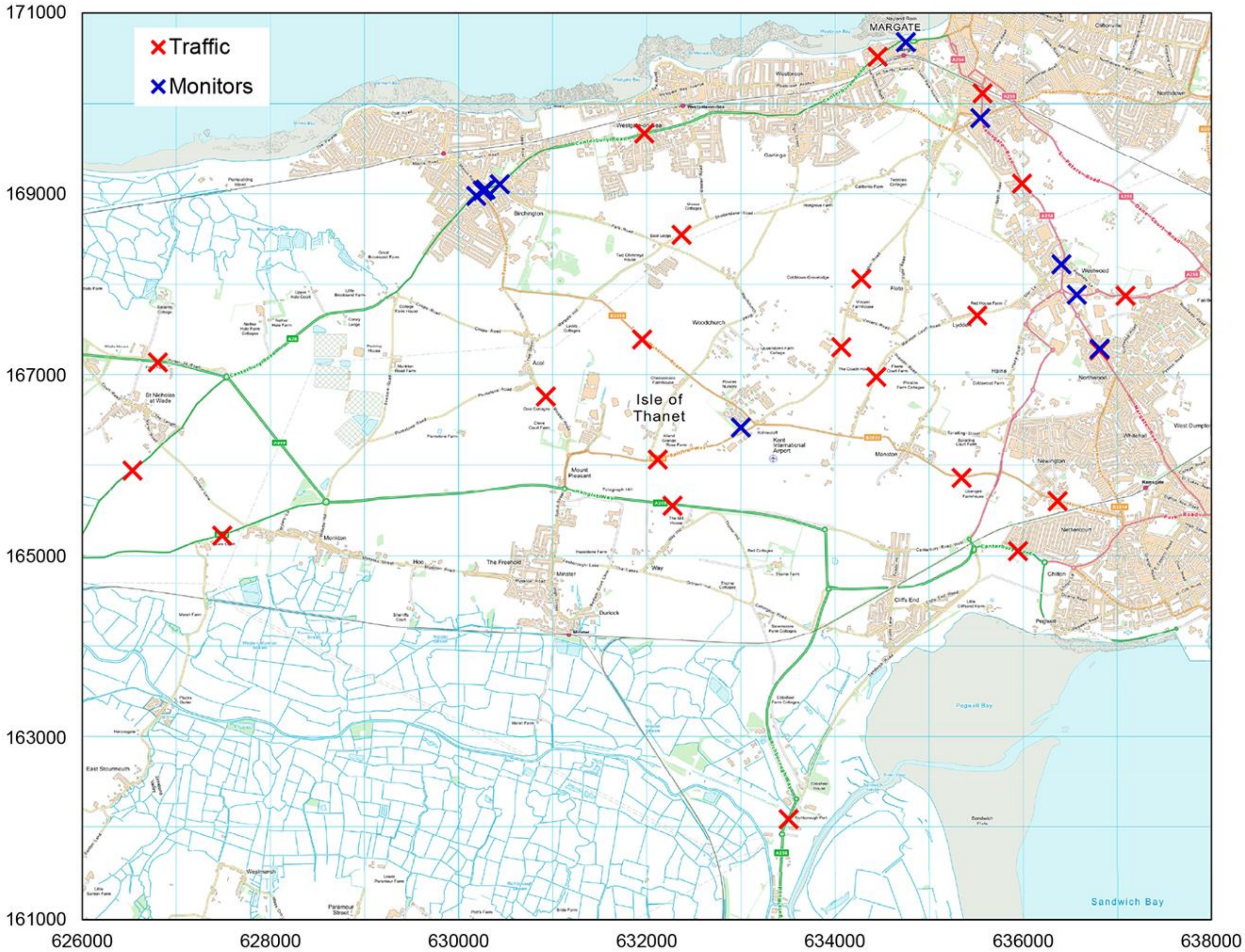
6.1.78 Emission factors are based on the relevant future year, or 2030 if earlier since projections are not available beyond 2030. Thus Year 2 uses 2020 emission factors, Year 6 uses 2024 emission factors, and Year 20 uses 2030 emission factors. This is a contrast to the approach taken for

[13] BSI (2009) Code of practice for noise and vibration control on construction and open sites. BS 5228-1:2009+A1:2014
[14] Directive 2004/26/EC of the European Parliament and of the Council of 21 April 2004 amending Directive 97/68/EC on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.
[15] Air Quality Consultants (2016) http://www.aqconsultants.co.uk/News/August-2016/Updated-CURED-to-V2A.aspx

aircraft (where current emission factors are used for future years, despite expectations that they will fall), and reflects the fact that projections for road traffic are much better established than for aircraft.

6.1.79 Locations of modelled links are shown in **Figure 6.9**.

Figure 6.9 Locations of modelled road links



Contains Ordnance Survey data © Crown copyright and database right 2017.

Verification

6.1.80 Verification of the model was undertaken using the method recommended by Defra[16]. A selection of road links were modelled where both traffic data and roadside monitoring data were available, using 2016 emission factors and meteorology. Locations of the monitors used for the verification are shown in **Figure 6.9**. The roads contribution was combined with the background concentrations from the Defra maps for 2016, and the resulting annual mean NO_2 concentrations at the monitoring locations were compared against 2016 monitoring results. An adjustment factor was derived from the comparison using the Defra method; this factor was calculated to be 2.86. This factor was applied to NO_2 concentrations and also to PM concentrations.

Dispersion Modelling and Calculation of NO_2 Concentrations

6.1.81 Dispersion modelling was carried out in ADMS-Roads. Sources were modelled as road sources, which allows ADMS-Roads to include appropriate initial dispersion, including the effects of traffic-

[16] Defra (2016) Local Air Quality Management Technical Guidance (TG16), April 2016.

induced turbulence which depends on traffic flows and HDV fraction. For consistency with the verification, a single meteorological year, 2016 was used, as recommended by Defra's TG16 methodology.

6.1.82 Rather than modelling the whole road network and identifying all near-road receptors, the DMRB approach of modelling transects was adopted. In this, each road link with traffic data was modelled as a straight-line source 1 km long, with a transect of receptors extending out from its mid-point to a distance of 200 m. This procedure takes account of the overall orientation of the link with respect to wind direction, and provides an indication of concentrations at different distances from the kerb of the road. This can then be used to identify receptors within particular concentration bands of the road.

6.1.83 Concentrations of NO_2 were calculated from NO_x concentrations using Defra's tool for this purpose[17]. Background concentrations were taken from Defra's background maps. This is different from the use of monitoring data for background concentrations used for on-airport sources, but is necessary to ensure that the conversion in the Defra spreadsheet works correctly.

Emission Factors and Background Maps

6.1.84 The assessment was based on version 7 of the Emission Factor Toolkit (EFT), the Defra maps and tools issued in 2016, and Calculator Using Realistic Emissions For Diesels (CURED) v2A. These form a coherent, consistent set of tools. In November 2017, Defra issued updates to the EFT, its background maps and its associated tools. However, the assessment was largely complete by this time, so it was not practical to repeat the assessment with the new data. In addition, CURED is based on the old tools and a new version consistent with the new tools is not yet available, and it is unclear at the time of writing whether the new EFT generates more realistic emissions than the old EFT with CURED. For these reasons, it was decided not to repeat the assessment with the new version of the tools.

Operation and Emission Scenarios

6.1.85 Three operational years have been assessed:

- Year 2, representing the first year of aircraft operation;
- Year 6, representing the point at which the aircraft exceeds 10,000 movements per year; and
- Year 20, representing the worst-case year in terms of likely emissions from aircraft and vehicular movements.

Calculation of Short-Period Average Concentrations

6.1.86 As described previously, the emissions are assigned to about 200 sources, each of which is represented in the model as a polyhedral volume within which the emissions occur and undergo initial mixing with the air. ADMS is unable to handle this many volume sources in a single run, so runs have been split into phase-specific runs with concentrations being combined externally. This makes it possible to obtain the total annual mean concentration of each pollutant at each receptor (and assists checking and source apportionment). However, it means ADMS cannot calculate concentrations over short-term averaging periods, e.g. for comparison with the hourly mean NO_2 limit value.

6.1.87 Therefore, the empirical relationships suggested in Defra's TG(16) guidance is used to estimate short-period concentrations, as follows:

- *"Exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60μg/m^3."*

[17] Defra (2016) NOx to NO2 conversion spreadsheet, Version 5.1. June 2016. https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc

6.1.88 and:

- *“To estimate potential exceedances of the PM_{10} 24-hour mean objective, local authorities should use the following relationship, provided in previous Technical Guidance, but still considered adequate:*
- *No. 24-hour mean exceedances = -18.5 + 0.00145 × annual mean3 + (206/annual mean)”*

Meteorology

6.1.89 For meteorological data to be suitable for dispersion modelling purposes, a number of meteorological parameters need to be measured on an hourly basis. These parameters include wind speed, wind direction, cloud cover and temperature. There are only a limited number of sites where the required meteorological measurements are made. The year of meteorological data that is used for a modelling assessment can also have a significant effect on ground level concentrations.

6.1.90 This assessment has used meteorological data recorded at the Manston Airport meteorological station for the five calendar years between 2012 and 2016 inclusive. The meteorological station is located on the airfield and is the nearest synoptic station to the site offering data in a suitable format for the model. A full set of wind roses for each year modelled is presented in **Figure 6.10** to **Figure 6.14**. Most large meteorological datasets contain rows which cannot be used by the dispersion model, because of instrument faults or because of very low wind speeds. **Table 6.18** shows the number of hours that could be used for each of the five years. The number of hours with inadequate met data was very low in each year.

Table 6.58 Meteorological data adequacy

Year	Number of hours in year	Number of hours used by ADMS	Percentage of hours used
2012	8784	8719	99.26
2013	8760	8658	98.84
2014	8760	8683	99.12
2015	8760	8662	98.88
2016	8784	8662	98.61

Figure 6.10 2012 wind rose

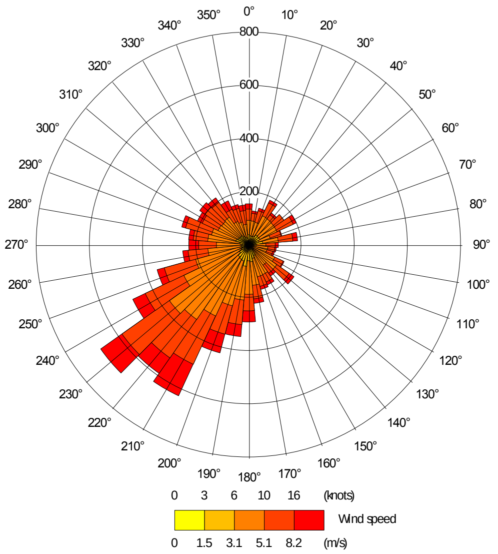


Figure 6.11 2013 wind rose

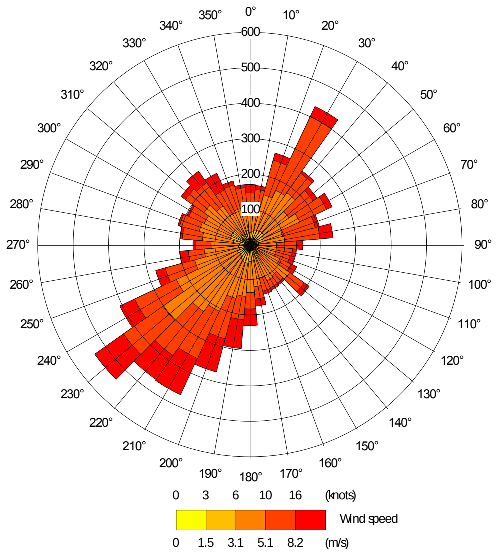


Figure 6.12 2014 wind rose

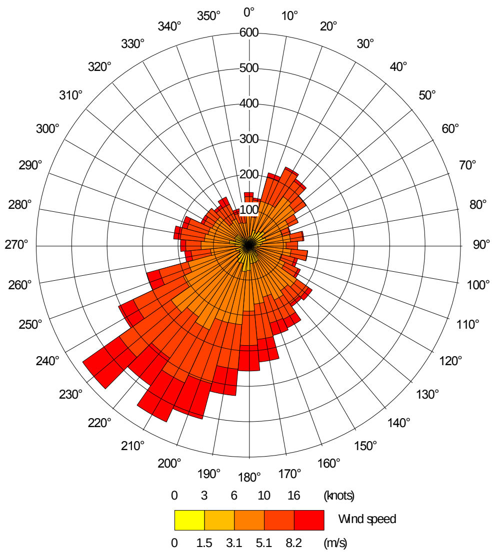


Figure 6.13 2015 wind rose

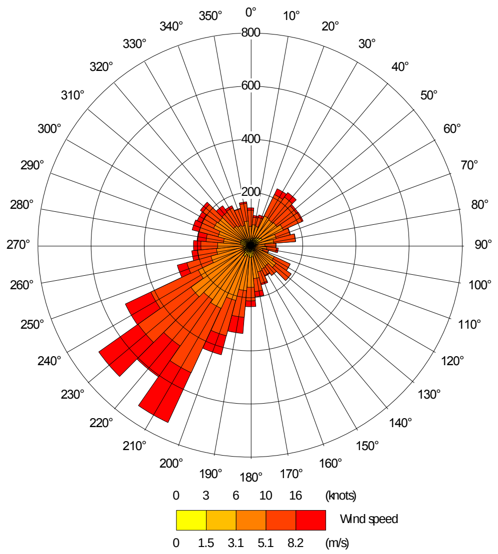
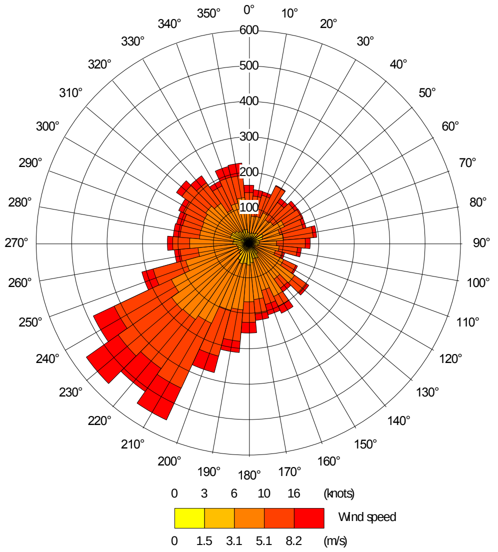


Figure 6.14 2016 wind rose



6.1.91 The wind roses show that winds are very predominantly from the southwest, with relatively few low wind speeds. There is little variation between years.

Complex Terrain

6.1.92 The predominant surface characteristics and land use in a model domain have an important influence in determining turbulent fluxes and, hence, the stability of the boundary layer and atmospheric dispersion. The most important of these are surface roughness length and topography/landform. These are discussed in the following section.

Terrain

6.1.93 The concentrations of an emitted pollutant found in elevated, complex terrain differ from those found in simple level terrain. There have been numerous studies on the effects of topography on atmospheric flows. The UK ADMLC provides a summary of the main effects of terrain on atmospheric flow and dispersion of pollutants[18]:

"Plume interactions with windward facing terrain features:

Plume interactions with terrain features whereby receptors on hills at a similar elevation to the plume experience elevated concentrations;

Direct impaction of the plume on hill slopes in stable conditions;

Flow over hills in neutral conditions can experience deceleration forces on the upwind slope, reducing the rate of dispersion and increasing concentrations; and

Recirculation regions on the upwind side of a hill can cause partial or complete entrainment of the plume, resulting in elevated ground level concentrations.

Plume interactions with lee sides of terrain features:

Regions of recirculation behind steep terrain features can rapidly advect pollutants towards the ground culminating in elevated concentrations; and

[18] Hill et al., 2005

As per the upwind case, releases into the lee of a hill in stable conditions can also be recirculated, resulting in increased ground level concentrations.

Plume interactions within valleys:

Releases within steep valleys experience restricted lateral dispersion due to the valley sidewalls. During stable overnight conditions, inversion layers develop within the valley essentially trapping all emitted pollutants. Following sunrise and the erosion of the inversion, elevated ground level concentrations can result during fumigation events; and

Convective circulations in complex terrain due to differential heating of the valley side walls can lead to the impingement of plumes due to crossflow onto the valley sidewalls and the subsidence of plume centrelines, both having the impact of increasing ground level concentrations."

6.1.94 These effects are most pronounced when the terrain gradients exceed 1 in 10, i.e. a 100 m change in elevation per 1 km step in the horizontal plane.

6.1.95 Gradients in the region around the Proposed Development are at most 1 in 25, so no terrain modelling is necessary.

Surface Roughness Length

6.1.96 Roughness length, z_0, represents the aerodynamic effects of surface friction and is defined as the height at which the extrapolated surface layer wind profile tends to zero. This value is an important parameter used by meteorological pre-processors to interpret the vertical profile of wind speed and estimate friction velocities which are, in turn, used to define heat and momentum fluxes and, consequently, the degree of turbulent mixing.

6.1.97 The surface roughness length is related to the height of surface elements; typically, the surface roughness length is approximately 10% of the height of the main surface features. Thus, it follows that surface roughness is higher in urban and congested areas than in rural and open areas. Oke[19] and CERC[20] suggest typical roughness lengths for various land use categories (**Table 6.19**).

Table 6.19 Typical surface roughness lengths for various land use categories

Type of Surface	z_0 (m)
Ice	0.00001
Smooth snow	0.00005
Smooth sea	0.0002
Lawn grass	0.01
Pasture	0.2
Isolated settlement (farms, trees, hedges)	0.4
Parkland, woodlands, villages, open suburbia	0.5–1.0
Forests/cities/industrialised areas	1.0–1.5
Heavily industrialised areas	1.5–2.0

[19] Oke, T.R., (1987) ‘Boundary Layer Climates’. 2nd Edition, Methuen.
[20] CERC (2003) ‘The Met Input Module’. ADMS Technical Specification.

6.1.98 Increasing surface roughness increases turbulent mixing in the lower boundary layer. With respect to elevated sources under neutral and stable conditions, increasing the roughness length can have complex and conflicting effects on ground level concentrations:

- The increased mixing can bring portions of an elevated plume down towards ground level, resulting in increased ground level concentrations close to the emission source; and
- The increased mixing increases entrainment of ambient air into the plume and dilutes plume concentrations, resulting in reduced ground level concentrations further downwind from an emission source.

6.1.99 The overall impact on ground level concentration is, therefore, strongly correlated to the distance of a receptor from the emission source.

6.1.100 We have used a roughness length of 0.1 m to represent the airport and its vicinity. Most of the key receptors are close to the airfield and within the rural landscape, so using a low roughness length will be conservative. Receptors in urban locations are further away and will experience a lower level of influence from emissions on the airport; they will be less sensitive to roughness length as the plume will be generally well-mixed within the boundary layer by the time it reaches these receptors.

Surface Energy Budget

6.1.101 One of the key factors governing the generation of convective turbulence is the magnitude of the surface sensible heat flux. This, in turn, is a factor of the incoming solar radiation. However, not all solar radiation arriving at the Earth's surface is available to be emitted back to atmosphere in the form of sensible heat. By adopting a surface energy budget approach, it can be identified that, for fixed values of incoming short and long wave solar radiation, the surface sensible heat flux is inversely proportional to the surface albedo and latent heat flux.

6.1.102 The surface albedo is a measure of the fraction of incoming short-wave solar radiation reflected by the Earth's surface. This parameter is dependent upon surface characteristics and varies throughout the year. Oke[19] recommends average surface albedo values of 0.6 for snow covered ground and 0.23 for non-snow-covered ground.

6.1.103 The latent heat flux is dependent upon the amount of moisture present at the surface. Areas where moisture availability is greater will experience a greater proportion of incoming solar radiation released back to atmosphere in the form of latent heat, leaving less available in the form of sensible heat and, thus, decreasing convective turbulence. The modified Priestly-Taylor parameter (α) can be used to represent the amount of moisture available for evaporation. Holstag and van Ulden[21] suggest values of 0.45 and 1.0 for dry grassland and moist grassland respectively.

6.1.104 A detailed analysis of the effects of surface characteristics on ground level concentrations by Auld et al.[22] led them to conclude that, with respect to uncertainty in model predictions:

> "…*the energy budget calculations had relatively little impact on the overall uncertainty*".

6.1.105 In this regard, it is not considered necessary to vary the surface energy budget parameters spatially or temporally, and annual averaged values have been adopted throughout the model domain for this assessment.

6.1.106 As snow covered ground is only likely to be present for a small fraction of the year, the surface albedo of 0.23 for non-snow-covered ground advocated by Oke[19] has been used whilst the model default α value of 1.0 has also been retained.

[21] Holstag and van Ulden (1983) 'The Stability of the Atmospheric Surface Layer during Nighttime'. American Met. Soc., 6th Symposium on Turbulence and Diffusion.
[22] Auld, V., Hill, R. and Taylor, T.J. (2002) 'Uncertainty in Deriving Dispersion Parameters from Meteorological Data'. Atmospheric Dispersion Modelling Liaison Committee (ADMLC). Annual Report 2002-2003.

Buildings

6.1.107 Any large object has an impact on atmospheric flow and air turbulence within the locality of the object. This can result in maximum ground level concentrations that are significantly different (generally higher) from those encountered in the absence of buildings. The building 'zone of influence' is generally regarded as extending a distance of 5L (where L is the lesser of the building height or width) from the foot of the building in the horizontal plane and three times the height of the building in the vertical plane.

6.1.108 Gaussian plume models are generally unable to model flows around complex arrangements of buildings; typically, this requires some form of computational fluid dynamics model, which presents other difficulties to the modeller. It is therefore common for air quality studies to model only simple arrangements of buildings close to the key emissions sources.

6.1.109 While numerous buildings will be present on site, in general they will be at a distance from the principal sources of emissions, especially from the runway. For this assessment, therefore, no attempt has been made to include buildings directly into the model. Instead, the effects of buildings are included by suitable choice of surface roughness length.

Conversion of NO to NO_2

6.1.110 Emissions of NO_x from combustion processes are predominantly in the form of nitric oxide (NO). Excess oxygen in the combustion gases and further atmospheric reactions cause the oxidation of NO to nitrogen dioxide (NO_2). NO_x chemistry in the lower troposphere is strongly interlinked in a complex chain of reactions involving Volatile Organic Compounds (VOCs) and Ozone (O_3). Two of the key reactions interlinking NO and NO_2 are detailed below:

$$NO_2 + O_2 \xrightarrow{h\nu} NO + O_3 \qquad \text{(R1)}$$

$$NO + O_3 \rightarrow NO_2 + O_2 \qquad \text{(R2)}$$

where *hv* is used to represent a photon of light energy (i.e. sunlight).

6.1.111 Taken together, reactions R1 and R2 produce no net change in O_3 concentrations, and NO and NO_2 adjust to establish a near steady state reaction (photo-equilibrium). However, the presence of VOCs and CO in the atmosphere offer an alternative production route of NO_2 for photolysis, allowing O_3 concentrations to increase during the day with a subsequent decrease in the NO_2:NO_x ratio.

6.1.112 However, at night, the photolysis of NO_2 ceases, allowing reaction R2 to promote the production of NO_2, at the expense of O_3, with a corresponding increase in the NO_2:NO_x ratio.

6.1.113 Near to an emission source of NO, the result is a net increase in the rate of reaction R2, suppressing O_3 concentrations immediately downwind of the source, and increasing further downwind as the concentrations of NO begin to stabilise to typical background levels[23].

6.1.114 Given the complex nature of NO_x chemistry, the EA Air Quality Modelling and Assessment Unit (AQMAU) have adopted a pragmatic, risk based approach in determining the conversion rate of NO to NO_2 which dispersion model practitioners can use in their detailed assessments[24]. AQMAU guidance advises that the source term should be modelled as NO_x (as NO_2) and then suggests a tiered approach when considering ambient NO_2:NO_x ratios:

- **Screening Scenario:** 50% and 100% of the modelled NO_x process contributions should be used for short-term and long-term average concentration, respectively. That is, 50% of the predicted NO_x concentrations should be assumed to be NO_2 for short-term assessments and 100% of the predicted NO_x concentrations should be assumed to be NO_2 for long-term assessments;

[23] Gillani, M V and Pliem, J E.(1996) Sub-grid scale features of anthropogenic emissions of NOx and VOC in the context of regional Eulerian models. Atmospheric Environment, 30, 2043–2059.
[24] Environment Agency (2005) 'Conversion ratios for NO_X and NO_2'.
http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf.

- **Worst Case Scenario:** 35% and 70% of the modelled NO_x process contributions should be used for short-term and long-term average concentration, respectively. That is, 35% of the predicted NO_x concentrations should be assumed to be NO_2 for short-term assessments and 70% of the predicted NO_x concentrations should be assumed to be NO_2 for long-term assessments; and
- **Case Specific Scenario:** Operators are asked to justify their use of percentages lower than 35% for short-term and 70% for long-term assessments in their application reports.

6.1.115 The current guidance from the EA[25] gives guidance on the screening stages of an assessment only, with very little guidance on how to carry out a detailed assessment. It therefore only gives the above "screening scenario" proportions. However, this is a detailed assessment, so the screening scenario factors are not relevant. In line with the AQMAU guidance, therefore, this assessment has used the 'Worst Case Scenario' approach in determining the conversion rate of NO to NO_2 as a robust assumption.

Deposition

6.1.116 The predominant route by which emissions to air will affect land is by deposition of atmospheric emissions. Ecological receptors can potentially be sensitive to the deposition of pollutants, particularly nitrogen and sulphur compounds, which can affect the character of the habitat through eutrophication and acidification.

6.1.117 Deposition processes in the form of dry and wet deposition remove material from a plume and alter the plume concentration. Dry deposition occurs when particles are brought to the surface by gravitational settling and turbulence. They are then removed from the atmosphere by deposition on the land surface. Wet deposition occurs due to rainout scavenging (within clouds) and washout scavenging (below clouds) of the material in the plume. These processes lead to a variation with downwind distance of the plume strength, and may alter the shape of the vertical concentration profile as dry deposition only occurs at the surface.

6.1.118 Near to sources of pollutants (<2 km), dry deposition is generally the predominant removal mechanism for pollutants such as NO_x, SO_2 and NH_3[26,27]. Dry deposition may be quantified from the near-surface plume concentration and the deposition velocity[28]:

$$F_d = v_d\, C(x,y,0)$$

where:

F_d = dry deposition flux ($\mu g\ m^{-2}\ s^{-1}$)

v_d = deposition velocity ($m\ s^{-1}$)

$C(x,y,0)$ = ground level concentration ($\mu g\ m^{-3}$)

6.1.119 EA guidance AQTAG06[27] recommends deposition velocities for various pollutants dependent upon the habitat type, reproduced as **Table 6.20**.

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[25] Environment Agency (2016) 'Air emissions risk assessment for your environmental permit'. https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit, last updated 2 August 2016.
[26] Fangmeier, A. et al., (1994) '*Effects of atmospheric ammonia on vegetation – a review*', Environmental Pollution, 86, 43–82.
[27] Environment Agency (2014) 'Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air', Approved March 2014.
[28] Chamberlin and Chadwick (1953). 'Deposition of Airborne Radioiodine Vapour.' Nucleonics, 2, 22-25.

Table 6.20 EA recommended deposition velocities

Pollutant	Deposition Velocity (m s^{-1})	
	Grassland	Forest
NO_2	0.0015	0.003
SO_2	0.012	0.024
HCl	0.025	0.06
NH_3	0.02	0.03
HNO_3	0.04	0.04
SO_4^{2-} (sulphate aerosol)	0.01	0.01

6.1.120 In order to assess the impacts of deposition, habitat-specific critical loads and critical levels have been created. These are generally defined similarly to:

> *"...a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*."[29]

6.1.121 It is important to distinguish between a critical load and a critical level. The critical load relates to the quantity of a material deposited from air to the ground, whilst critical levels refer to the concentration of a material in air. The UK APIS provides critical load data for designated ecological sites (SPAs, SACs and SSSIs) in the UK.[30]

6.1.122 The critical loads used to assess the impact of compounds deposited to land which result in eutrophication and acidification are expressed in terms of kilograms of nitrogen deposited per hectare per year (kg N ha^{-1} y^{-1}) and kilo-equivalents deposited per hectare per year (keq ha^{-1} y^{-1}). The unit of 'equivalents' (eq) is used for the purposes of assessing acidification, rather than a unit of mass. The unit eq (1 keq ≡ 1,000 eq) refers to molar equivalent of potential acidity resulting from e.g. sulphur, oxidised and reduced nitrogen, as well as base cations. Essentially, it means 'moles of charge' and is a measure of how acidifying a particular chemical species can be.

6.1.123 To convert the predicted concentration in air of NO_2, SO_2, NH_3, or HNO_3, the following formula is used:

$DR_i = C_i \, v_{di} \, f_i$

where:

DR_i = annual deposition of N or S (kg N ha^{-1} y^{-1} or kg S ha^{-1} y^{-1})

C_i = annual mean concentration of the ith chemical species (µg m^{-3})

v_{di} = deposition velocity of ith species (**Table 6.20**)

f_i = factor to convert from µg m^{-2} s^{-1} to kg ha^{-1} y^{-1} for the ith species (**Table 6.21**).

6.1.124 **Table 6.21** provides the relevant conversion factors as extracted from AQTAG06[27].

[29] Nilsson J. and Grennfelt P. (Eds) 1988. 'Critical Loads for Sulphur and Nitrogen'. Miljorapport 1988:15. Nordic Council of Ministers, Copenhagen.

[30] APIS also has information on critical levels. Critical Levels for air pollutants are not habitat specific (as critical loads are), but have been set to cover broad vegetation types.

Table 6.21 EA factors for converting modelled deposition rates

Pollutant	Conversion factor (µg m^{-2} s^{-1} to kg ha^{-1} y^{-1})	
	Of	f_i
NO_2	N	96
SO_2	S	157.7
HNO_3	N	70.1
NH_3	N	259.7

Source: Environment Agency [27]

6.1.125 In order to convert deposition of N or S to acid equivalents, the following relationships can be used:

- 1 keq ha^{-1} y^{-1} = 14 kg N ha^{-1} y^{-1}; and
- 1 keq ha^{-1} y^{-1} = 16 kg S ha^{-1} y^{-1}.

6.1.126 With respect to wet deposition, EA[27] states:

“It is considered that wet deposition of SO_2, NO_2 and NH_3 is not significant within a short range.”

6.1.127 Therefore, the assessment only considers dry deposition of nutrifying and acidifying N and S compounds.

6.1.128 **Table 6.22** lists the ecologically designated sites for which deposition is calculated, and says which of the deposition velocities from **Table 6.20** are used.

Table 6.22 Deposition velocity class for ecological sites

Receptor	Class	Receptor	Class	Receptor	Class	Receptor	Class
E01	Grassland	**E23**	Grassland	**E45**	Grassland	**E67**	Grassland
E02	Grassland	**E24**	Grassland	**E46**	Grassland	**E68**	Grassland
E03	Grassland	**E25**	Grassland	**E47**	Grassland	**E69**	Forest
E04	Grassland	**E26**	Grassland	**E48**	Grassland	**E70**	Forest
E05	Grassland	**E27**	Grassland	**E49**	Grassland	**E71**	Forest
E06	Grassland	**E28**	Grassland	**E50**	Grassland	**E72**	Forest
E07	Grassland	**E29**	Grassland	**E51**	Grassland	**E73**	Forest
E08	Grassland	**E30**	Grassland	**E52**	Grassland	**E74**	Forest
E09	Grassland	**E31**	Grassland	**E53**	Grassland	**E75**	Forest
E10	Grassland	**E32**	Grassland	**E54**	Grassland	**E76**	Forest
E11	Grassland	**E33**	Grassland	**E55**	Grassland	**E77**	Forest
E12	Grassland	**E34**	Grassland	**E56**	Forest	**E78**	Forest
E13	Grassland	**E35**	Grassland	**E57**	Forest	**E79**	Forest
E14	Grassland	**E36**	Grassland	**E58**	Forest	**E80**	Forest

Receptor	Class	Receptor	Class	Receptor	Class	Receptor	Class
E15	Grassland	E37	Grassland	E59	Forest	E81	Forest
E16	Grassland	E38	Grassland	E60	Forest	E82	Forest
E17	Grassland	E39	Grassland	E61	Forest	E83	Forest
E18	Grassland	E40	Grassland	E62	Forest	E84	Forest
E19	Grassland	E41	Grassland	E63	Forest	E85	Forest
E20	Grassland	E42	Grassland	E64	Forest	E86	Forest
E21	Grassland	E43	Grassland	E65	Forest	E87	Forest
E22	Grassland	E44	Grassland	E66	Forest	E88	Forest

Special Treatments

Other Treatments

6.1.129 Specialised model treatments, for short-term (puff) releases, coastal models, fluctuations or photochemistry were not used in this assessment.

Sensitivity Analysis and Uncertainty

Sensitivity Analysis

6.1.130 Wherever possible, this assessment has used worst-case scenarios, which will exaggerate the impact of the emissions on the surrounding area, including emissions, operational profile, ambient concentrations, meteorology and surface roughness. This assessment has considered five years of meteorological data, with data reported from the year(s) predicting the highest ground-level concentrations at each receptor.

Model Uncertainty

6.1.131 Process emissions have been modelled under expected operation using the standard steady state algorithms in ADMS to determine the impact on local receptors. In order to model atmospheric dispersion using standard Gaussian methods, the following assumptions and limitations have to be made:

- Conservation of mass: the entire mass of emitted pollutant remains in the atmosphere and no allowance is made for loss due to chemical reactions or deposition processes (although the standard Gaussian model can be modified to include such processes). Portions of the plume reaching the ground are assumed to be dispersed back away from the ground by turbulent eddies (eddy reflection);
- steady state emissions: emission rates are assumed to be constant and continuous over the time averaging period of interest; and
- steady state meteorology: no variations in wind speed, direction or turbulent profiles occur during transport from the source to the receptor. This assumption is reasonable within a few kilometres of a source but may not be valid for receptor distances in the order of tens of kilometres. For example, for a receptor 50 km from a source and with a wind speed of 5 m s^{-1} it will take nearly three hours for the plume to travel this distance during which time many different processes may change (e.g., the sun may rise or set and clouds may form or dissipate affecting the turbulent profiles). For this reason, Gaussian models are practically limited to predicting concentrations within ~20 km of a source.

6.1.132 As a result of the above, and in combination with other factors, not least attempting to replicate stochastic processes (e.g. turbulence) by deterministic methods, dispersion modelling is inherently uncertain, but is nonetheless a useful tool in plume footprint visualisation and prediction of ground level concentrations. Dispersion models have been widely used in the UK for both regulatory and compliance purposes for a number of years and this is an accepted approach for this type of assessment.

6.1.133 This assessment has incorporated a number of worst-case assumptions, as described above, which will result in an overestimation of the predicted ground level concentrations from the process. As a result of these worst-case assumptions, the predicted results should be considered the upper limit of model uncertainty for a scenario where the actual site impact is determined. Therefore, the actual predicted ground level concentrations would be expected to be lower than those reported in this assessment and, in some cases, significantly lower.

Significance Evaluation Methodology: Site-Specific Critical Loads

6.1.134 As noted in the main text (**Section 6.7**), information held on the APIS website has been reviewed in order to identify the main habitat/species features and their site relevant critical loads. **Table 6.23** and **Table 6.24** summarise this information.

Table 6.23 Critical Load data for nutrient nitrogen deposition

Receptor	Minimum critical load (kg N ha^{-1} y^{-1})	Feature	Relevant Nitrogen Critical Load Class
E01–E17, E25, E26, E36	8	Sterna albifrons (Eastern Atlantic - breeding) - Little tern (A195)	Coastal stable dune grasslands - acid type
E18, E19	Not sensitive	Reefs (H1170)	N/A
E20–E24, E27–E34	8	Fixed coastal dunes with herbaceous vegetation ("grey dunes") (H2130)	Coastal stable dune grasslands - acid type
E35, E37–E42	Not assessed	Supralittoral sediment (Ammophila arenaria - arrhenatherum elatius dune grassland)	No critical load has been assigned for this feature
E43, E44, E48, E49	5	Gallinago gallinago (Europe - breeding) - Common snipe (A153)	Raised and blanket bogs
E45–E47	No critical load	Vertigo moulinsiana - Desmoulin`s whorl snail (S1016)	No comparable habitat with established critical load estimate available
E50–E55, E67, E68	20	Low and medium altitude hay meadows	N/A
E56–E66, E69–E88	10	Broadleaved deciduous woodland	N/A

Table 6.24 Critical Load data for acid deposition

Receptor	CLmaxS (kg N ha^{-1} y^{-1})	CLminN (kg N ha^{-1} y^{-1})	CLmaxN (kg N ha^{-1} y^{-1})	Feature	Acidity Class
E01–E17, E25, E26, E36	0.88	0.223	1.13	Pluvialis apricaria [North-western Europe - breeding] - European golden plover (A140)	Acid grassland
E18, E19	Not sensitive	Not sensitive	Not sensitive	Reefs (H1170)	N/A
E20–E24, E27–E34	0.9	0.223	1.123	Fixed coastal dunes with herbaceous vegetation ("grey dunes") (H2130)	Acid grassland

Receptor	CLmaxS (kg N ha^{-1} y^{-1})	CLminN (kg N ha^{-1} y^{-1})	CLmaxN (kg N ha^{-1} y^{-1})	Feature	Acidity Class
E35, E37–E42	0.321	0.248	0.526	Pluvialis apricaria - Golden Plover	Bogs
E43, E44, E48, E49	0.227	0.321	0.542	Gallinago gallinago (Europe - breeding) - Common snipe (A153)	Bogs
E45–E47	No critical load	No critical load	No critical load	Vertigo moulinsiana - Desmoulin`s whorl snail (S1016)	Freshwater
E50–E55, E67, E68	3.93	0.85	4.79	Calcareous grassland (using base cation)	N/A
E56–E58, E66, E75, E76	1.77	0.14	1.91	Broadleafed/Coniferous unmanaged woodland	N/A
E59, E85–E88	1.67	0.14	1.81	Broadleafed/Coniferous unmanaged woodland	N/A
E60	10.81	0.14	10.96	Broadleafed/Coniferous unmanaged woodland	N/A
E61, E77	1.68	0.14	1.82	Broadleafed/Coniferous unmanaged woodland	N/A
E62–E64, E70, E71	10.83	0.14	10.97	Broadleafed/Coniferous unmanaged woodland	N/A
E65	1.72	0.14	1.86	Broadleafed/Coniferous unmanaged woodland	N/A
E69, E72–E74	1.77	0.14	1.92	Broadleafed/Coniferous unmanaged woodland	N/A
E78–E84	10.82	0.14	10.97	Broadleafed/Coniferous unmanaged woodland	N/A

Sources of Model Conservatism

6.1.135 The model methodology aims to be realistic and accurate as far as possible. However, there are areas where the information available is sufficiently uncertain (especially about the future) that it is necessary to ensure that assumptions err on the side of being conservative — that is, they will tend to overpredict environmental impacts to avoid the risk of underpredicting them.

6.1.136 These have been detailed above, but are summarised here to help provide a picture of the degree of conservatism in the model.

6.1.137 Key sources of conservatism include:

- Background concentrations are based on the higher of Defra's modelled forecasts and current monitoring data, where available and suitable.
- The assumed background non-roads NO_2 is taken as the upper range of monitoring results.
- Where monitoring data is used to obtain background concentrations, the average of the 2007 – 2015 data is used, disregarding a tendency of concentrations to fall over the years.
- Similarly, background data is assumed to be either recent monitoring data or 2016 Defra modelled data, with no account taken of expected reductions in future years.
- Where critical loads are given as a range, the lower end of the range is used as the assessment level.

- Aircraft engines are chosen conservatively, with a general assumption that engines will be those that entered into service in the mid-1990s. For the A320, the V2527-A5 engine has been assumed, which has emissions at the high end of the possible engines.
- For aircraft emissions of PM, the FOA3a method is used, which gives higher emission rates than the FOA3 method.
- Aircraft are assumed to take off using 100% thrust. Reduced thrust is ignored.
- Measures to reduce emissions on the ground such as reduced-engine taxiing are ignored.
- Climb and approach emissions are modelled within volume sources, the bottom of which is at the lower end of the height range represented (in other words, elevated emissions are modelled closer to the ground than in reality).
- Each construction phase is assumed to be focused into a single calendar year, with all activity and corresponding emissions for the phase occurring during the corresponding assessment year.
- Estimates of total NO_2 concentrations are based on the worst-case scenario NO_2:NO_x ratios.

Appendix 6.4

Odour Assessment

Introduction

6.1.138 This appendix sets out the results of an assessment of the effects of the Proposed Development on odour. Although an assessment of odour impacts is not required under the regulations, a number of stakeholders have requested information on the topic, so this chapter presents a brief assessment.

6.1.139 This appendix should be read in conjunction with the description of the Proposed Development (**Chapter 3: Description of the Proposed Development**). Following a summary of the limitations of the ES, the chapter outlines the relevant policy, legislation and guidance that has informed the assessment, and the data gathering methodology that was adopted as part of the assessment. This leads on to a description of the overall baseline conditions, the scope of the assessment, and the assessment methodology. The chapter concludes with a summary of the results of the assessment at this point in time.

6.1.140 The principal sources of odour from the Proposed Development are:

- Fugitive emissions of volatile components of aircraft fuel; and
- Emissions of products of incomplete combustion from aircraft engines and other vehicles and plant.

6.1.141 The assessment estimates the effects of odours on receptors around the Proposed Development. These odour effects are then evaluated for significance in relation to the benchmarks set in guidance and custom and practice.

6.1.142 There are no generally accepted methodologies for estimating the effects of odours from airports. This is a rather common situation in odour assessments, so guidance from the Institute of Air Quality Management (IAQM)[31] suggests that a variety of qualitative and quantitative approaches be taken, depending on the particular circumstances of an assessment. A combination of more than one approach may be appropriate for an assessment.

Limitation of the ES

6.1.143 No technical difficulties have been encountered whilst preparing the Odour Chapter of the ES.

Policy, Legislation and Guidance

6.1.144 A study of planning policy, legislation and guidance at the national, regional and local level has been undertaken for the site and its locality in order to highlight any requirements which the Proposed Development needs to consider. It is always important that policies, legislation and guidance are taken into consideration as they help to define the scope of assessment and can inform the identification of particular local issues. Full details of all national and local planning policies relevant to the Proposed Development can be found in **Appendix 4.1**.

International

6.1.145 No international policy with explicit reference to odour control has been identified.

[31] IAQM (2014) Guidance on the assessment of odour for planning.

UK Legislation and Policy

Draft National Policy Statement

6.1.146 The 2017 Draft Airports National Policy Statement[32] is mainly focused on policy regarding a third runway at Heathrow Airport. The Draft NPS has this to say on the subject of odour:

6.1.147 *"The construction and operation of airports infrastructure has the potential to create a range of emissions such as dust, odour, artificial light, smoke and steam. All have the potential to have a detrimental impact on amenity or cause a common law nuisance or statutory nuisance under Part III, Environmental Protection Act 1990.197 These may also be covered by pollution control or other environmental consenting regimes.*

6.1.148 *Because of the potential effects of these emissions and in view of the availability of the defence of statutory authority against nuisance claims described previously, it is important that the potential for these impacts is considered by the applicant in its application, by the Examining Authority in examining applications, and by the Secretary of State in taking decisions on development consent.*

6.1.149 *For nationally significant infrastructure projects of the type covered by the Airports NPS, some impact on amenity for local communities is likely to be unavoidable. Impacts should be kept to a minimum and should be at a level that is acceptable...*

6.1.150 *Decision making*

6.1.151 *The Secretary of State should be satisfied that all reasonable steps have been taken, and will be taken, to minimise any detrimental impact on amenity from emissions of dust, odour, artificial light, smoke and steam. This includes the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

6.1.152 *If development consent is granted for a project, the Secretary of State should consider whether there is a justification for all of the authorised project (including any associated development) being covered by a defence of statutory authority against nuisance claims. If the Secretary of State cannot conclude that this is justified, then the defence should be disapplied, in whole or in part, through a provision in the development consent order."*

Local

6.1.153 Thanet District Council's (TDC) Local Plan was adopted in 2006, and 93 of the policies have been saved and remain in force. None of these refer to odour, except in the context of hot food takeaways.

National guidance

6.1.154 The Environment Agency's guidance note "H4 Odour Management - how to comply with your environmental permit"[33] gives guidance on odour management for installations subject to permitting, including assessing, controlling and monitoring odours.

6.1.155 The Institute of Air Quality Management's Guidance on the assessment of odour for planning[34] provides a framework for assessing odour impacts for planning purposes.

6.1.156 Whether a particular odour will cause an annoyance reaction from human beings in their normal everyday environment is determined by a number of different but interacting factors, including:

- The concentration of the odour in the atmosphere;

[32] Department for Transport (2017) Revised Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England. October 2017. https://www.gov.uk/government/publications/revised-draft-airports-national-policy-statement
[33] https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management. Dated 4 April 2011.
[34] IAQM (2014) Guidance on the assessment of odour for planning.

- The nature of the odour (how objectionable it is perceived to be);
- How frequently it occurs and for how long.

6.1.157 Odour concentration is expressed as European odour units per cubic metre at standard conditions for olfactometry (ou_E m^{-3}) as compared to a European reference concentration of a known standard odorant in air (n-butanol). The odour concentration, in simple terms, is the number of times an odorous sample of air has to be diluted with odour-free air to reach its odour threshold. Exposure is usually quantified in terms of a frequency of occurrence over a year of hourly average concentrations above a certain odour concentration limit.

6.1.158 Unlike other forms of air pollution, odours are not generally additive. This reflects the way in which the brain responds to odour. The human brain has a tendency to "screen out" those odours which are always present or those that are in context to their surroundings. For example, an individual is more likely to be tolerant of an odour from a factory in an industrial area than in the countryside. The human brain will also develop a form of acceptance to a constant background of local odours.

6.1.159 With regard to the concentrations of odour in the atmosphere that can be detected and recognised by the human olfactory system, and the levels which would cause annoyance or give rise to complaint, there are clearly a number of factors involved. These factors are commonly associated with the FIDOL acronym:

- Frequency of detection: the number of exposures to an odour within a given time frame;
- Intensity as perceived: the magnitude of the perception of the odour;
- Duration: the time period over which the odour exposure occurs;
- Offensiveness: this is a qualitative judgement to describe the odour;
- Location: the type of receptor will determine its sensitivity to odour, e.g. residential properties are likely to be associated with greater sensitivity than industrial locations.

6.1.160 An olfactory response to an odorant will typically occur due to transient peaks or fluctuations in concentrations over very short periods of time, typically in the order of 1 minute or less. However, H4 provides odour benchmarks based on achievement of a 1 hour mean concentration, not to be exceeded for more than 2% of a year (i.e. a 98th percentile 1-hour mean value). The H4 odour benchmarks can be considered to represent a criterion for 'no reasonable cause for annoyance', rather than a benchmark representative of detection.

6.1.161 In H4, odour generating processes are grouped into three categories dependent upon their perceived offensiveness:

- Highly offensive - processes involving animal or fish remains, brickworks, creamery, fat and grease processing, wastewater treatment, oil refining, livestock feed factory;
- Moderately offensive - intensive livestock rearing, fat frying (food processing), sugar beet processing, these are odours which do not obviously fall within the high or low categories; and
- Less offensive - chocolate manufacture, brewery, confectionery, fragrance and flavourings, coffee roasting, bakery.

6.1.162 Annoyance thresholds are then prescribed based on the 98th percentile of hourly averaged odour concentrations during the year and dependent upon the offensiveness of the process, as described above:

- Highly offensive = 1.5 ou_E m^{-3};
- Moderately offensive = 3.0 ou_E m^{-3}; and
- Less offensive = 6.0 ou_E m^{-3}.

Data Gathering Methodology

6.1.163 This section describes the desk study undertaken to inform the greenhouse gas emissions assessment.

Desk Study

6.1.164 Maps have been examined to identify obvious existing sources of odour in the vicinity of the Proposed Development. The Environmental Health Officer at Thanet District Council was contacted for information about odour complaints from the previous airport operation.

Survey Work

6.1.165 No survey work was carried out for the odour assessment. This is standard practice for new developments since there is currently no operation to generate odour, and potential odours from other sources are not additive in their effects on receptors.

Consultation

6.1.166 Since 2015 and throughout the undertaking of the survey and assessment work, RiverOak Strategic Partners (RiverOak) has engaged with consultees (see **Chapter 1: Introduction** for more information). A non-statutory consultation took place from June to September 2016. A scoping report (**Appendix 1.1**), which proposed scoping out odour from further assessment, was produced and submitted to the Planning Inspectorate who provided a scoping opinion (**Appendix 1.2**). A statutory consultation then took place from June to July 2017, consulting on the preliminary environmental information report (the 2017 PEIR) in accordance with the provisions of the 2009 EIA Regulations. A further PEIR was produced for the 2018 consultation (the 2018 PEIR) which took place in January 2018, which contained an odour assessment.

6.1.167 Organisations that were consulted include:

- The Planning Inspectorate (PINS); and
- Thanet District Council.

6.1.168 A summary of the consultee comments and responses provided is provided in **Table 6.25** below along with a response to identify how the matter is dealt with in this report.

Table 6.25 Consultee comments

Consultee	Comments and considerations	How addressed in this ES
PINS	It is proposed to scope out odour assessment from the air quality assessment based on the relatively small size of the development. The Secretary of State does not agree to scoping this out and considers that further justification is required based on the geographic location of potential odour sources and any potential sensitive receptors. The Applicant's attention is drawn to TDC's comments, contained in Appendix 3, in this regard. This justification must include reference to the potential for movement of contaminated material during construction. Otherwise, the applicant should provide an assessment in accordance with the relevant Institute of Air Quality Management (IAQM) standards.	A qualitative and quantitative assessment of odour is included in the ES, in accordance with the IAQM Guidance. The potential for movement of contaminated material during construction will be addressed as part of the Construction Environmental Management Plan (CEMP).

Consultee	Comments and considerations	How addressed in this ES
Thanet District Council	Odour assessment - it is agreed that there is not accepted methodology for undertaking odour assessment but noted that this work has been undertaken at other airports, and therefore there could be further assessment of the potential odour effects from the operation of the airport in order to allow for the effect to be scoped out from further assessment.	A qualitative and quantitative assessment of odour is included in the ES in accordance with the IAQM Guidance.

Scope of the Assessment

6.1.169 This section sets out information on: the process whereby receptors are identified; the potential receptors that could be affected by the Proposed Development; and the potential effects on receptors that could be caused by the Proposed Development.

6.1.170 The scope of assessment has been informed by: the scoping study; consultee responses to the Scoping Report and the 2017 PEIR; and the design of the Proposed Development.

Approach to Identifying Receptors

6.1.171 Human receptors have been identified in the same way as for the air quality assessment (qv). Ecological receptors have not been included in the odour assessment.

Spatial and Temporal Scope

6.1.172 All emissions from airport-related activities are included within this assessment.

6.1.173 In terms of temporal scope, it is proposed to assess just Year 20 of operation, being the year of peak activity. Odour emissions are expected to increase with airport activity, and background odour levels are not expected to change in the future, so only a single assessment year is justified.

Likely Significant Effects

6.1.174 The likely significant effects from the Proposed Development, which are subject to further discussion in this chapter, are summarised below.

- Products of incomplete combustion from aircraft engines. These are greatest when the engines are at low thrust settings, for example during taxiing or hold.
- Emissions of volatile components of aviation fuel (that is, components that evaporate readily at ambient conditions). The bulk of aviation fuel at Manston Airport will be Jet A1, which is a form of kerosene (paraffin) and is much less volatile than petrol. Because of the low volatility, it is not usual practice to use vapour recovery to control emissions of Jet A1.
- The airport will also use smaller quantities of avgas (aviation spirit) for piston-engine aircraft. This is similar to petrol, with high volatility, and vapour recovery is normally used to control emissions.

6.1.175 Emissions of unburnt fuel will arise from the following processes:

- Deliveries to fuel farm tanks, filling tankers/bowsers and filling aircraft fuel tanks, displacing vapour within the tanks; and
- Breathing from tanks as temperature and pressure changes affect the mass of vapour in the headspace.

Overall Odour Baseline

Current Baseline

6.1.176 The Proposed Development lies is a rural area but on the edge of the urban area of Ramsgate. Other than two sewage works about 2.5 km south of the airport site, no specific sources of odour have been identified. Sources of odour are likely to be those associated with the rural environment, such as farm activities, those associated with the urban environment such as commercial and light industrial installations, and road traffic.

6.1.177 At those receptors judged most sensitive to potential odours from the Proposed Development, the most likely baseline sources of odour are rural and road sources.

6.1.178 Thanet District Council has said that the previous airport operation caused "only occasional" odour complaints, mainly from the Smuggler's Leap development[35]. However, details of the complaints have not been provided.

Future Baseline

6.1.179 No significant additional sources of odour have been identified among committed or proposed developments and so it is anticipated that the position would stay the same.

Environmental Measures Incorporated into the Proposed Development

6.1.180 This section lists the environmental measures relevant to odour emissions which have been incorporated into the Proposed Development. Where achievable and agreed environmental measures have been incorporated into the Proposed Development, the effect that those environmental measures have on the significance of potential effects is taken into account during the assessment. In some cases, a potential effect may require no further consideration following incorporation of appropriate environmental measures.

6.1.181 A summary of the environmental measures that have been incorporated into the development proposals to date in order to avoid, reduce or compensate for potential adverse air quality effects is provided below in **Table 6.26**.

Table 6.26 Rationale for incorporation of environmental measure

Potential receptor	Predicated changes and potential effects	Incorporated measure
Operational Phase		
Human receptors	Odours from aircraft operations	Airfield design and operational measures to minimise the amount of time aircraft have engines running on the ground. Use of fixed electrical ground power (FEGP) to minimise engine use at stand. Airfield design to minimise taxi times.
Human receptors	Odours from unburnt fuel	Vapour recovery on avgas (aviation spirit) tanks.

Assessment Methodology

Overview

6.1.182 Methods for assessing odour impacts are generally much less quantitative and precise than for many other topics such as air quality and noise. Instead, considerable judgement is required. This is true even for common, well-studied sources of problem odour such as waste-water treatment

[35] Amanda Berry, Thanet District Council (2017). Personal communication.

works and intensive livestock facilities. There is no consensus on how best to estimate odour impacts from airports.

6.1.183 In particular, there is no validated calculation to derive odour emissions from hydrocarbon emissions and there is no UK hydrocarbon standard benchmark to compare against hydrocarbon modelling predictions that would allow us to understand and evaluate quantitatively, the odour impact of the proposed site. The best available quantitative approach is the Copenhagen method, discussed below.

6.1.184 The IAQM guidance on odour assessments acknowledges the often subjective and judgement-based nature of odour assessments. It suggests both quantitative and qualitative approaches, acknowledging the weaknesses of each, and recommends that alternative methods should be used side-by-side where practical.

6.1.185 Accordingly, for this assessment, two approaches have been followed.

- A quantitative assessment using the Copenhagen method; and
- A risk-based approach based on the 2014 IAQM guidance on the assessment of odour for planning.

6.1.186 It must be repeated that both these methods should be considered indicative of the risk of odour problems, rather than a robust evaluation. In particular, it is important to recognise that the apparent precision of the quantitative approach is not necessarily reflective of its accuracy.

6.1.187 The above discussion relates to airport operations as a whole. However, it is possible to quantify the effects from unburnt fuel more confidently, as detailed below.

Operation and Emission Scenarios

6.1.188 Since odour emissions are expected to increase with airport activity, and since the background odour levels are not expected to change in the future, only a single operational year has been assessed, namely Year 20, representing the peak forecast year in terms of movements.

Unburnt Fuel Vapours

6.1.189 Emissions from the fuel storage tanks are calculated using a simplified version of the US Environmental Protection Agency's AP-42 method[36]. It is assumed that the tanks are fixed-roof tanks; floating roof tanks will typically have lower emissions. The AP-42 methodology estimates losses from filling the tanks (which displaces air which contains fuel vapour) and from diurnal breathing (expansion and contraction of the airspace as the temperature fluctuates over the day–night period).

6.1.190 The three Jet A1 tanks are assumed to have a capacity of 700 m^3 each, and to have a combined throughput of 290,000 m^3 $year^{-1}$ in Year 20. It is assumed that these are served airside by five tankers/bowsers of capacity 38 m^3 each. The AP-42 methodology means there are small differences in the calculated emissions depending on the tank size, but the results are not very sensitive to these assumptions.

6.1.191 The avgas tank is assumed to have a capacity of 20 m^3, and to have a throughput of 35 m^3 $year^{-1}$. It is assumed to be served by a single tanker/bowser of capacity 20 m^3.

6.1.192 ADMS 5 has been used to model dispersion of emissions from the fuel farm tanks. Modelling assumptions are consistent with those used for the main air quality assessment (meteorological data, surface roughness, etc.) Emissions from the tanks have been modelled as point sources from the top of the tanks, with the tanks themselves modelled as buildings. Emissions from tankers and bowsers have been modelled as a point source near the tanks, and 3 m above the ground; this

[36] Jimmy Peress, Tritech Consulting Engineers (2001) Estimate Storage Tank Emissions. CEP Magazine, August 2001. http://people.clarkson.edu/~wwilcox/Design/stortank.pdf

makes the conservative assumption that breathing losses all take place on the fuel farm rather than across the wider airfield.

6.1.193 Published odour values for Jet A1 or kerosene have not been found but odour guidance from the Scottish Environment Protection Agency[37] states that the odour threshold value for diesel is 60 µg m^{-3}, which is therefore equivalent to 1 ou_E m^{-3}. The same relationship is assumed to hold for Jet A1. Despite its higher vapour pressure, avgas is used in such small quantities that it makes a negligible contribution to emissions, so the same odour factor is used for this component.

Aircraft Emissions: Risk-based Approach

6.1.194 The following risk assessment methodology has been used to assess the potential odour risk at the identified receptors during the operational phase of the Proposed Development using meteorological data obtained from Manston Airport during the 5-year period 2012 – 2016. It must be noted that the intensity of the odour and the distance between the receptor and the Proposed Development have not been taken into consideration: worst-case intensity is assumed.

6.1.195 This assessment is not a prediction of what will actually occur during the operational life of the site but the likelihood of occurrences. Furthermore, an occurrence does not mean that any of the receptors will experience an effect or give rise to a complaint.

6.1.196 The greatest potential for adverse odour effects to occur is during periods of stable atmospheric conditions with calm or low wind speeds, generally when wind speeds are less than 3 m s^{-1}. This reduces dilution and mixing of odours with ambient air and results in higher odour concentrations at receptor locations. The percentage of time that a receptor is at risk is based on the following calculation:

- Total number of operating hours as a fraction of number of hours when source can operate in a year × fraction of hours when a wind of less than 3 m s^{-1} blows towards the receptor.

6.1.197 It is assumed that the airport operates continuously round the clock; no credit is taken for reduced operations at night. In fact, low wind speeds are generally more common at night so this is a conservative assumption.

6.1.198 The probability that the wind is blowing from the airport towards the receptor, with a speed of less than 3 m s^{-1}, is calculated. A 90° range of wind directions centred on the identified receptor is used to ensure that the spatial extent of the airport is captured, and also takes into account the uncertainty of the measured wind directions and the plume width from the source.

6.1.199 This calculation uses long-term (5 years, 2012 – 2016) averaged weather data from the Manston Airport synoptic meteorological station.

6.1.200 The distance between the receptors and the sources has not been taken into account in the risk calculation. Similarly, the fact that the sources are generally elevated (due to the height of the aircraft engines and the plume rise from the heat of the exhaust) has not been taken into account.

6.1.201 From this calculation, the risk of odour exposure is calculated and rated as described in **Table 6.27**. However, it is worth noting that this is not a prediction of what will actually occur during the operational life of the site, but the likelihood of occurrences.

Table 6.27 Matrix indicating magnitude of risk of odour exposure

At risk percentage	>10%	5–10%	2–5%	1–2%	<1%
Magnitude of risk	High	High	Medium	Low	Negligible

[37] SEPA (2010) Odour guidance 2010. https://www.sepa.org.uk/media/154129/odour_guidance.pdf

6.1.202 Guidance in respect of the sensitivity of potential odour sensitive receptors is taken from the Environment Agency's Horizontal Guidance Note H4 and from IAQM guidance on the assessment of odour for planning (2014) and summarized in **Table 6.28**.

Table 6.28 Odour sensitivity by receptor types

Sensitivity	Receptor types
High	Dwellings Hospitals Schools / education sites Tourist / cultural sites
Medium	Places of work Offices and other commercial premises Food retailers Playing / recreation fields
Low	Farms Light and heavy industry Footpaths Roads

6.1.203 **Table 6.29** presents a matrix extracted from the IAQM guidance for odour assessment 2014, which shows the interaction between sensitivity of receptors and magnitude of the risk of odour exposure. This has been used to determine the significance of any odour effects due to the airport operation at each identified sensitive receptor.

Table 6.29 Likely magnitude of odour effect at the specific receptor location

Sensitivity	Low receptor sensitivity	Medium receptor sensitivity	High receptor sensitivity
High risk of odour exposure	Slight adverse effect	Moderate adverse effect	Substantial adverse effect
Medium risk of odour exposure	Negligible effect	Slight adverse effect	Moderate adverse effect
Low risk of odour exposure	Negligible effect	Negligible effect	Slight adverse effect
Negligible risk of odour exposure	Negligible effect	Negligible effect	Negligible effect

Aircraft Emissions: Quantitative Approach

6.1.204 Winther et al[38] used an odour panel to determine the odour emissions from an aircraft main engine and an APU engine at take-off and idle thrust settings. The main engine was the JT8D-219 engine fitted to an MD80 aircraft. The APU was a Honeywell GTCP 131-9A fitted to an Airbus 321-200 aircraft. The odour from the high thrust runs was attributed to NO_2 predominantly, but the odour from the idle runs was attributed to unburnt hydrocarbon (HC) emissions. Using an assumed emission rate of HC from the main engine, they calculated an odour factor of 57 ou per mg of HC. This factor lies midway between factors of about 23 ou/mg HC used in Düsseldorf and Hamburg airport studies and 110 ou/mg HC used at Frankfurt Airport. They did not attempt to derive an ou:HC factor for the APU.

[38] Morten Winther, Uffe Kousgaard and Arne Oxbøl (2006) Calculation of odour emissions from aircraft engines at Copenhagen Airport. Science of the Total Environment 366 218–232.

6.1.205 They then carried out a dispersion modelling study, similar to that described in the main air quality chapter of this ES, using emissions based on ICAO databank emission factors and a Gaussian dispersion modelling tool, to calculate concentrations of odour around the airport for seven days of varying meteorological conditions. However, they did not attempt to relate their modelled odour concentrations to actual perceived odours at receptors. It should also be noted that the odour factor was based on a single engine type.

6.1.206 A similar approach of relating HC concentrations derived from dispersion modelling with odour concentrations has been tried at other airports, for example as part of the Stansted Generation 2 project. Generally, these have found poor correlation between modelled HC concentrations and indicators of high odour such as complaints but this may, in part, be due to people's sporadic motivation to raise a complaint.

6.1.207 The wide range of ou:HC ratios should also be noted: a factor of more than 4 just in three studies. This provides an indication of the uncertainty around this approach. It may therefore be concluded that the evidence base for using the Copenhagen approach as a way of estimating odours arising from airports is weak.

6.1.208 Nonetheless, the Copenhagen approach has been used at a number of assessments since, including at Farnborough[39] and City[40] airports in the UK. Neither of these studies attempted to validate the model.

6.1.209 Notwithstanding the weak evidence base for this approach, as this approach has been used at other airports, a Copenhagen-style calculation has been carried out for this assessment. This is in the spirit of the IAQM guidance to use a variety of approaches where practical. The methodology may be stated briefly: HC concentrations are calculated at receptors using the same methodology as for the main air quality pollutants such as NO_x (see main air quality chapter), and these are converted to modelled odour concentrations by applying the 57 ou/mg HC factor.

6.1.210 It must be emphasised that the quantitative results obtained should be treated as no more than indicative. They may be compared with results from the other UK studies mentioned above as benchmarks, but are unlikely to be reliable as absolute forecasts of odour levels.

Assessment of Odour Impact

6.1.211 This section sets out the calculated impact of odours using the two calculation methods.

Unburnt Fuel Vapours

6.1.212 Emissions of Jet A1 vapour are estimated to be 50 t year^{-3}, and emissions of avgas vapour to be 0.03 t year^{-1}.

6.1.213 The modelled 98th percentile hourly odour concentrations from this source at selected receptors are given in **Table 6.30**. A contour plot is shown in **Figure 6.15**.

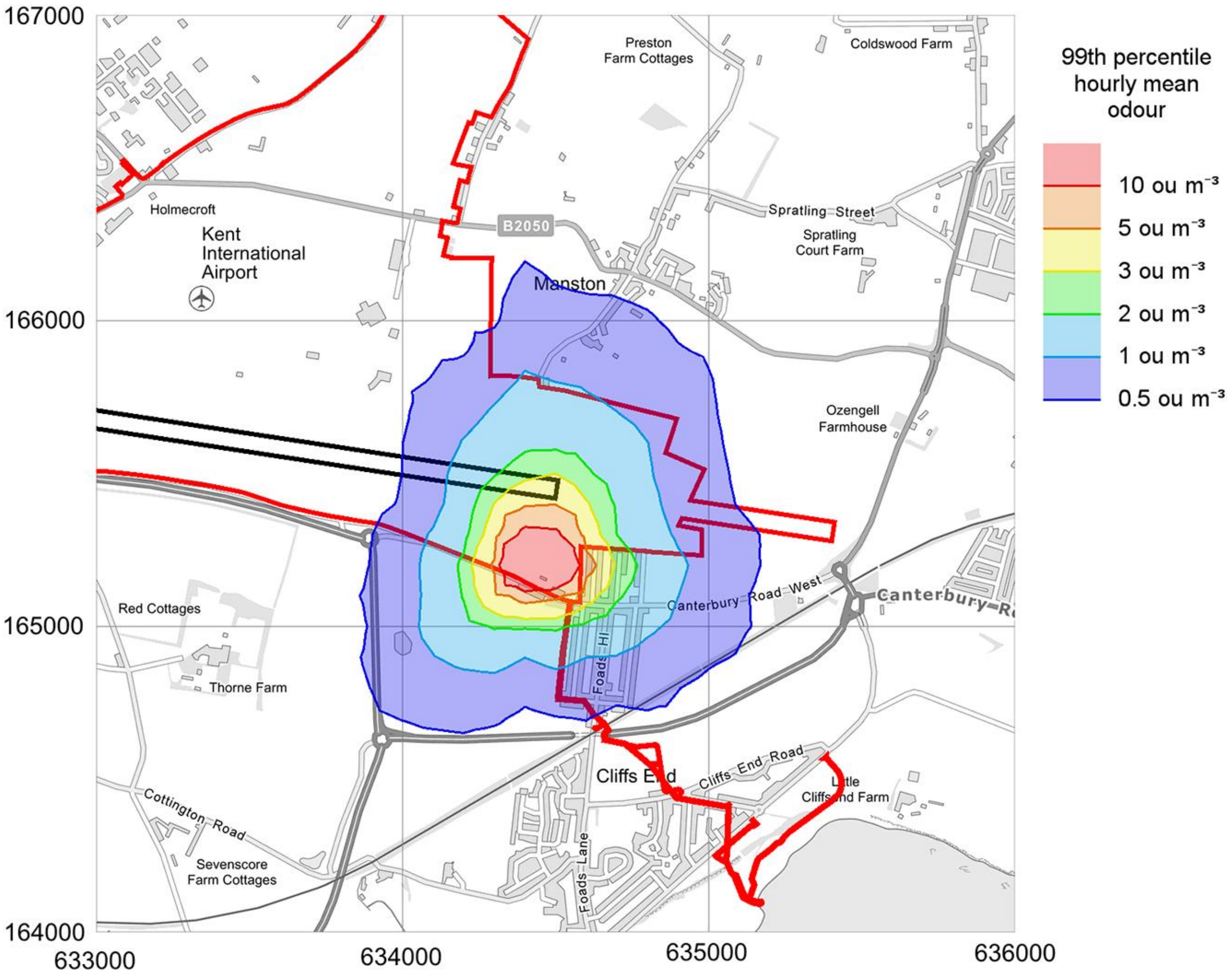
Table 6.30 PCs for 99th percentile hourly odour concentrations from fuel farm, Year 20

Receptor	AQAL (oe$_E$ m^{-3})	PC (ou$_E$ m^{-3})	% PC of AQAL
H34	3	1.71	57.1%
H35	3	2.08	69.4%
H36	3	2.67	89.0%

[39] Ove Arup (2009) Rushmoor Borough Council: Farnborough Airport odour assessment. 209721.
[40] City Airport Development Programme, Updated Environmental Statement Chapter 09 - Air Quality (2015). https://www.londoncityairport.com/content/cadp/CADP%201%20Submitted%20Material/CADP%20Updated%20Environmental%20Statement/UES%20Volume%201%20Updated%20ES%20Sept%202015/UES%20Chapter%2009%20-%20Air%20Quality%20(Final).pdf

Receptor	AQAL (oe$_E$ m^{-3})	PC (ou$_E$ m^{-3})	% PC of AQAL
H37	3	3.20	106.6%
H38	3	4.18	139.4%
H39	3	5.64	188.0%
H40	3	5.67	189.1%
H41	3	4.68	156.0%
H42	3	3.51	117.0%
H43	3	5.57	185.6%
H44	3	9.21	307.0%
H69	3	65.28	2175.9%

Figure 6.15 The modelled 98th percentile hourly odour concentrations from this source at selected receptors



Contains Ordnance Survey data © Crown copyright and database right 2017

6.1.214 Note that the H69 receptor represents the proposed redevelopment of the Jentex site into residential accommodation, which is inconsistent with using the same site for the fuel farm as part of the Proposed Development. This receptor may therefore be disregarded for the present purposes.

6.1.215 These results suggest that, without mitigation, odour concentrations in Year 20 may be up to 9 ou_E m^{-3} at relevant receptors, and exceedance of the 3 ou_E m^{-3} guideline value may occur at around 30 properties.

Aircraft Emissions: Risk-based Approach

6.1.216 At the assessed receptors, the probability of the wind blowing from the airport towards that receptor at a speed less than 3 m s^{-1} is between 3.1% and 5.2%, with three of the specific receptors (H46, H47 and H48) being above 5%. These three receptors are to the south of the airfield. Because all these receptors are considered to be High sensitivity, at most receptors the effect is classified as Moderate Adverse, but at the three receptors to the south of the airfield the impact is classified as Substantial Adverse.

Aircraft Emissions: Quantitative Approach

6.1.217 The Copenhagen method predicts that the 98th percentile hourly odour concentration is less than 1 ou_E m^{-3} at all modelled receptors. The highest odour concentration is 0.65 ou_E m^{-3} at the S02 RAF Museum receptors. These concentrations are comfortably below the 3 ou_E m^{-3} Environment Agency annoyance threshold for moderately offensive odours, and are in fact below the normal limit of detection.

Conclusions of Preliminary Significance Evaluation

6.1.218 It is clear that the two methods of estimating odours from aircraft emissions give very different results, with the risk-based approach suggesting a substantial adverse impact, and the Copenhagen approach suggesting that odours will be undetectable at the 98th percentile. This is a reflection of the difficulty inherent in estimating odours from unusual sources such as airports before they start operating.

6.1.219 The Conclusions on the significance of all those effects that have been subject to assessment are summarised in **Table 6.31**.

Table 6.31 Summary of significance of effects: Year 20

Impact type	Significance Level	Rationale
Odour from fuel farm	High	Significant likelihood of odours above the H4 criterion without further mitigation.
Odour from aircraft operations	Uncertain	Methodologies provide inconsistent results.

6.1.220 The modelled emissions from the fuel farm assume a fixed roof design with no vapour recovery. The following mitigation measures are recommended for the fuel farm at this stage to reduce odours to an acceptable level:

- Vapour recovery; and
- A floating roof design.

6.1.221 The recommended measures above can reduce emissions by 80% or more, which should effectively eliminate the risk of an odour problem from the fuel farm. Actual mitigation measures will be reviewed during the detailed design stage.

Appendix 6.5 Detailed results at receptors

6.1.222 This appendix presents embedded spreadsheets containing full concentration results at the specific receptors.

- Concentrations at receptors_Year2_ES.xlsx
- Concentrations at receptors_Year6_ES.xlsx
- Concentrations at receptors_Year20_ES.xlsx

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m·	% PC of AC	% PEC of A	Impact
E01	621048	168683	0	30	0.14	30.47	0.5%	101.6%	Not significant
E02	625191	169137	0	30	0.04	25.94	0.1%	86.5%	Not significant
E03	628533	169560	0	30	0.09	25.99	0.3%	86.6%	Not significant
E04	629867	169917	0	30	0.11	26.01	0.4%	86.7%	Not significant
E05	630740	169804	0	30	0.13	26.03	0.4%	86.8%	Not significant
E06	631813	170059	0	30	0.16	26.06	0.5%	86.9%	Not significant
E07	632683	170381	0	30	0.15	26.05	0.5%	86.8%	Not significant
E08	633993	170521	0	30	1.04	42.49	3.5%	141.6%	Further assessment required
E09	635116	170740	0	30	1.35	48.78	4.5%	162.6%	Further assessment required
E10	636457	171381	0	30	0.39	41.28	1.3%	137.6%	Further assessment required
E11	637964	171321	0	30	0.46	37.96	1.5%	126.5%	Further assessment required
E12	639028	171113	0	30	0.25	32.43	0.8%	108.1%	Not significant
E13	639841	170161	0	30	0.11	28.62	0.4%	95.4%	Not significant
E14	639882	168631	0	30	0.13	31.79	0.4%	106.0%	Not significant
E15	639810	167452	0	30	0.22	31.79	0.7%	106.0%	Not significant
E16	639527	166684	0	30	0.14	31.43	0.5%	104.8%	Not significant
E17	639241	165688	0	30	0.41	44.48	1.4%	148.3%	Further assessment required
E18	638891	165003	0	30	0.27	41.79	0.9%	139.3%	Not significant
E19	638595	164294	0	30	0.19	29.70	0.6%	99.0%	Not significant
E20	637303	164087	0	30	0.23	27.86	0.8%	92.9%	Not significant
E21	636318	164194	0	30	0.38	26.28	1.3%	87.6%	Further assessment required
E22	635298	164386	0	30	0.55	26.45	1.8%	88.2%	Further assessment required
E23	634800	164047	0	30	0.39	26.29	1.3%	87.6%	Further assessment required
E24	634346	163650	0	30	0.36	41.88	1.2%	139.6%	Further assessment required
E25	633796	162733	0	30	0.18	26.08	0.6%	86.9%	Not significant
E26	633703	162425	0	30	0.16	26.06	0.5%	86.9%	Not significant
E27	634513	161455	0	30	0.10	26.00	0.3%	86.7%	Not significant
E28	633502	161188	0	30	0.13	38.78	0.4%	129.3%	Not significant
E29	635337	160698	0	30	0.07	25.97	0.2%	86.6%	Not significant
E30	633692	159746	0	30	0.07	25.97	0.2%	86.6%	Not significant
E31	634794	159415	0	30	0.06	25.96	0.2%	86.5%	Not significant
E32	635708	159117	0	30	0.06	44.50	0.2%	148.3%	Not significant
E33	633607	158133	0	30	0.05	25.95	0.2%	86.5%	Not significant
E34	635539	157577	0	30	0.03	25.93	0.1%	86.4%	Not significant
E35	633584	156906	0	30	0.04	25.94	0.1%	86.5%	Not significant
E36	635214	156105	0	30	0.03	25.93	0.1%	86.4%	Not significant
E37	632347	155607	0	30	0.03	25.93	0.1%	86.4%	Not significant
E38	632033	163044	0	30	0.19	26.09	0.6%	87.0%	Not significant
E39	632554	162933	0	30	0.20	26.10	0.7%	87.0%	Not significant
E40	633412	162328	0	30	0.15	26.05	0.5%	86.8%	Not significant
E41	633527	162189	0	30	0.14	26.04	0.5%	86.8%	Not significant
E42	632364	162425	0	30	0.16	26.06	0.5%	86.9%	Not significant
E43	622112	162206	0	30	0.03	25.93	0.1%	86.4%	Not significant
E44	623126	162989	0	30	0.04	25.94	0.1%	86.5%	Not significant
E45	624052	162872	0	30	0.05	32.51	0.2%	108.4%	Not significant
E46	624096	162621	0	30	0.05	25.95	0.2%	86.5%	Not significant
E47	623938	162268	0	30	0.04	25.94	0.1%	86.5%	Not significant
E48	623648	161865	0	30	0.04	25.94	0.1%	86.5%	Not significant
E49	622879	161358	0	30	0.05	35.17	0.2%	117.2%	Not significant
E50	631694	164088	0	30	0.40	31.78	1.3%	105.9%	Not significant
E51	631458	164099	0	30	0.40	26.30	1.3%	87.7%	Not significant
E52	631039	164107	0	30	0.38	26.28	1.3%	87.6%	Not significant
E53	632436	162421	0	30	0.16	26.06	0.5%	86.9%	Not significant
E54	631908	162848	0	30	0.19	38.26	0.6%	127.5%	Not significant
E55	631008	162944	0	30	0.18	26.08	0.6%	86.9%	Not significant
E56	630479	164211	0	30	0.30	26.20	1.0%	87.3%	Not significant
E57	630389	164405	0	30	0.28	26.18	0.9%	87.3%	Not significant
E58	630172	164540	0	30	0.23	26.13	0.8%	87.1%	Not significant
E59	633116	169430	0	30	0.26	26.16	0.9%	87.2%	Not significant
E60	633976	168913	0	30	0.39	30.82	1.3%	102.7%	Not significant
E61	635881	166552	0	30	0.61	32.11	2.0%	107.0%	Not significant
E62	635634	165614	0	30	0.74	43.04	2.5%	143.5%	Not significant
E63	635696	165271	0	30	0.59	26.49	2.0%	88.3%	Not significant
E64	635212	165108	0	30	1.62	41.48	5.4%	138.3%	Not significant
E65	635302	164394	0	30	1.01	43.53	3.4%	145.1%	Not significant
E66	634825	164063	0	30	0.39	26.29	1.3%	87.6%	Not significant
E67	634369	163647	0	30	0.25	26.15	0.8%	87.2%	Not significant
E68	634218	163399	0	30	0.22	26.12	0.7%	87.1%	Not significant
E69	633122	163264	0	30	0.23	26.13	0.8%	87.1%	Not significant
E70	633581	165056	0	30	1.22	32.21	4.1%	107.4%	Not significant
E71	633420	165112	0	30	1.35	27.25	4.5%	90.8%	Not significant
E72	633441	164876	0	30	0.93	26.83	3.1%	89.4%	Not significant
E73	633330	164922	0	30	1.00	26.90	3.3%	89.7%	Not significant
E74	632062	164071	0	30	0.33	26.23	1.1%	87.4%	Not significant
E75	631267	164655	0	30	0.49	26.39	1.6%	88.0%	Not significant
E76	631135	164551	0	30	0.45	26.35	1.5%	87.8%	Not significant
E77	631149	166159	0	30	0.37	26.27	1.2%	87.6%	Not significant
E78	632034	166274	0	30	1.36	27.26	4.5%	90.9%	Not significant
E79	632106	166329	0	30	1.38	27.28	4.6%	90.9%	Not significant
E80	632102	166377	0	30	1.27	27.17	4.2%	90.6%	Not significant
E81	633049	166413	0	30	8.90	34.80	29.7%	116.0%	Not significant
E82	633119	166478	0	30	8.75	34.65	29.2%	115.5%	Not significant
E83	632891	166706	0	30	2.39	28.29	8.0%	94.3%	Not significant
E84	632763	166769	0	30	1.85	27.75	6.2%	92.5%	Not significant
E85	631105	168000	0	30	0.29	26.19	1.0%	87.3%	Not significant
E86	631260	168095	0	30	0.30	26.20	1.0%	87.3%	Not significant
E87	631603	168434	0	30	0.28	26.18	0.9%	87.3%	Not significant
E88	632016	168303	0	30	0.34	26.24	1.1%	87.5%	Not significant
M01	635931	165331	1.6	30	0.53	26.43	1.8%	88.1%	
M02	638483	165430	1.6	30	0.19	26.09	0.6%	87.0%	
M03	630284	169052	1.6	30	0.16	26.06	0.5%	86.9%	

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m·	% PC of AC	% PEC of A	Impact
M04	639019	167981	1.6	30	0.12	26.02	0.4%	86.7%	
M05	635539	169840	1.6	30	0.19	26.09	0.6%	87.0%	
M06	630254	169037	1.6	30	0.16	26.06	0.5%	86.9%	
M07	634445	164416	1.6	30	0.52	26.42	1.7%	88.1%	
M08	638492	165410	1.6	30	0.18	26.08	0.6%	86.9%	
M09	639097	165971	1.6	30	0.15	26.05	0.5%	86.8%	
M10	634662	166026	1.6	30	2.66	28.56	8.9%	95.2%	
M11	632984	166419	1.6	30	5.93	31.83	19.8%	106.1%	
M12	631161	165486	1.6	30	0.48	26.38	1.6%	87.9%	
M13	636570	167891	1.6	30	0.29	26.19	1.0%	87.3%	
M14	636405	168227	1.6	30	0.30	26.20	1.0%	87.3%	
M15	635932	165333	1.6	30	0.53	26.43	1.8%	88.1%	
M16	630438	169111	1.6	30	0.16	26.06	0.5%	86.9%	
M17	630186	168983	1.6	30	0.16	26.06	0.5%	86.9%	
M18	638616	165564	1.6	30	0.18	26.08	0.6%	86.9%	
M19	638472	165432	1.6	30	0.19	26.09	0.6%	87.0%	
M20	637135	165354	1.6	30	0.30	26.20	1.0%	87.3%	
M21	636815	167297	1.6	30	0.28	26.18	0.9%	87.3%	
M22	638220	168614	1.6	30	0.14	26.04	0.5%	86.8%	
M23	637112	165331	1.6	30	0.30	26.20	1.0%	87.3%	
M24	638536	165465	1.6	30	0.18	26.08	0.6%	86.9%	
M25	637092	165340	1.6	30	0.30	26.20	1.0%	87.3%	
M26	638528	165426	1.6	30	0.18	26.08	0.6%	86.9%	

Year 2. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E01	621048	168683	0	200	0.06	25.96	0.0%	13.0%	Not significant
E02	625191	169137	0	200	0.13	26.03	0.1%	13.0%	Not significant
E03	628533	169560	0	200	0.19	26.09	0.1%	13.0%	Not significant
E04	629867	169917	0	200	0.24	26.14	0.1%	13.1%	Not significant
E05	630740	169804	0	200	0.29	26.19	0.1%	13.1%	Not significant
E06	631813	170059	0	200	0.42	26.32	0.2%	13.2%	Not significant
E07	632683	170381	0	200	0.32	26.22	0.2%	13.1%	Not significant
E08	633993	170521	0	200	0.37	26.27	0.2%	13.1%	Not significant
E09	635116	170740	0	200	0.32	26.22	0.2%	13.1%	Not significant
E10	636457	171381	0	200	0.23	26.13	0.1%	13.1%	Not significant
E11	637964	171321	0	200	0.18	26.08	0.1%	13.0%	Not significant
E12	639028	171113	0	200	0.16	26.06	0.1%	13.0%	Not significant
E13	639841	170161	0	200	0.13	26.03	0.1%	13.0%	Not significant
E14	639882	168631	0	200	0.20	26.10	0.1%	13.0%	Not significant
E15	639810	167452	0	200	0.30	26.20	0.2%	13.1%	Not significant
E16	639527	166684	0	200	0.36	26.26	0.2%	13.1%	Not significant
E17	639241	165688	0	200	0.38	26.28	0.2%	13.1%	Not significant
E18	638891	165003	0	200	0.46	26.36	0.2%	13.2%	Not significant
E19	638595	164294	0	200	0.49	26.39	0.2%	13.2%	Not significant
E20	637303	164087	0	200	0.61	26.51	0.3%	13.3%	Not significant
E21	636318	164194	0	200	0.83	26.73	0.4%	13.4%	Not significant
E22	635298	164386	0	200	1.25	27.15	0.6%	13.6%	Not significant
E23	634800	164047	0	200	0.69	26.59	0.3%	13.3%	Not significant
E24	634346	163650	0	200	0.78	26.68	0.4%	13.3%	Not significant
E25	633796	162733	0	200	0.54	26.44	0.3%	13.2%	Not significant
E26	633703	162425	0	200	0.49	26.39	0.2%	13.2%	Not significant
E27	634513	161455	0	200	0.49	26.39	0.2%	13.2%	Not significant
E28	633502	161188	0	200	0.34	26.24	0.2%	13.1%	Not significant
E29	635337	160698	0	200	0.37	26.27	0.2%	13.1%	Not significant
E30	633692	159746	0	200	0.28	26.18	0.1%	13.1%	Not significant
E31	634794	159415	0	200	0.33	26.23	0.2%	13.1%	Not significant
E32	635708	159117	0	200	0.29	26.19	0.1%	13.1%	Not significant
E33	633607	158133	0	200	0.21	26.11	0.1%	13.1%	Not significant
E34	635539	157577	0	200	0.24	26.14	0.1%	13.1%	Not significant
E35	633584	156906	0	200	0.17	26.07	0.1%	13.0%	Not significant
E36	635214	156105	0	200	0.20	26.10	0.1%	13.0%	Not significant
E37	632347	155607	0	200	0.10	26.00	0.1%	13.0%	Not significant
E38	632033	163044	0	200	0.47	26.37	0.2%	13.2%	Not significant
E39	632554	162933	0	200	0.38	26.28	0.2%	13.1%	Not significant
E40	633412	162328	0	200	0.42	26.32	0.2%	13.2%	Not significant
E41	633527	162189	0	200	0.43	26.33	0.2%	13.2%	Not significant
E42	632364	162425	0	200	0.34	26.24	0.2%	13.1%	Not significant
E43	622112	162206	0	200	0.22	26.12	0.1%	13.1%	Not significant
E44	623126	162989	0	200	0.23	26.13	0.1%	13.1%	Not significant
E45	624052	162872	0	200	0.29	26.19	0.1%	13.1%	Not significant
E46	624096	162621	0	200	0.30	26.20	0.1%	13.1%	Not significant
E47	623938	162268	0	200	0.29	26.19	0.1%	13.1%	Not significant
E48	623648	161865	0	200	0.27	26.17	0.1%	13.1%	Not significant
E49	622879	161358	0	200	0.24	26.14	0.1%	13.1%	Not significant
E50	631694	164088	0	200	0.85	26.75	0.4%	13.4%	Not significant
E51	631458	164099	0	200	0.89	26.79	0.4%	13.4%	Not significant
E52	631039	164107	0	200	0.95	26.85	0.5%	13.4%	Not significant
E53	632436	162421	0	200	0.33	26.23	0.2%	13.1%	Not significant
E54	631908	162848	0	200	0.45	26.35	0.2%	13.2%	Not significant

Year 2. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E55	631008	162944	0	200	0.61	26.51	0.3%	13.3%	Not significant
E56	630479	164211	0	200	1.20	27.10	0.6%	13.6%	Not significant
E57	630389	164405	0	200	1.28	27.18	0.6%	13.6%	Not significant
E58	630172	164540	0	200	1.20	27.10	0.6%	13.5%	Not significant
E59	633116	169430	0	200	0.39	26.29	0.2%	13.1%	Not significant
E60	633976	168913	0	200	0.52	26.42	0.3%	13.2%	Not significant
E61	635881	166552	0	200	0.60	26.50	0.3%	13.2%	Not significant
E62	635634	165614	0	200	1.43	27.33	0.7%	13.7%	Not significant
E63	635696	165271	0	200	1.57	27.47	0.8%	13.7%	Not significant
E64	635212	165108	0	200	1.79	27.69	0.9%	13.8%	Not significant
E65	635302	164394	0	200	1.26	27.16	0.6%	13.6%	Not significant
E66	634825	164063	0	200	0.71	26.61	0.4%	13.3%	Not significant
E67	634369	163647	0	200	0.78	26.68	0.4%	13.3%	Not significant
E68	634218	163399	0	200	0.72	26.62	0.4%	13.3%	Not significant
E69	633122	163264	0	200	0.46	26.36	0.2%	13.2%	Not significant
E70	633581	165056	0	200	0.92	26.82	0.5%	13.4%	Not significant
E71	633420	165112	0	200	1.07	26.97	0.5%	13.5%	Not significant
E72	633441	164876	0	200	0.83	26.73	0.4%	13.4%	Not significant
E73	633330	164922	0	200	0.93	26.83	0.5%	13.4%	Not significant
E74	632062	164071	0	200	0.75	26.65	0.4%	13.3%	Not significant
E75	631267	164655	0	200	1.33	27.23	0.7%	13.6%	Not significant
E76	631135	164551	0	200	1.30	27.20	0.7%	13.6%	Not significant
E77	631149	166159	0	200	0.84	26.74	0.4%	13.4%	Not significant
E78	632034	166274	0	200	1.21	27.11	0.6%	13.6%	Not significant
E79	632106	166329	0	200	1.00	26.90	0.5%	13.5%	Not significant
E80	632102	166377	0	200	0.95	26.85	0.5%	13.4%	Not significant
E81	633049	166413	0	200	1.13	27.03	0.6%	13.5%	Not significant
E82	633119	166478	0	200	1.04	26.94	0.5%	13.5%	Not significant
E83	632891	166706	0	200	0.77	26.67	0.4%	13.3%	Not significant
E84	632763	166769	0	200	0.73	26.63	0.4%	13.3%	Not significant
E85	631105	168000	0	200	0.47	26.37	0.2%	13.2%	Not significant
E86	631260	168095	0	200	0.50	26.40	0.3%	13.2%	Not significant
E87	631603	168434	0	200	0.52	26.42	0.3%	13.2%	Not significant
E88	632016	168303	0	200	0.59	26.49	0.3%	13.2%	Not significant
M01	635931	165331	1.6	200	1.43	27.33	0.7%	13.7%	
M02	638483	165430	1.6	200	0.51	26.41	0.3%	13.2%	
M03	630284	169052	1.6	200	0.30	26.20	0.2%	13.1%	
M04	639019	167981	1.6	200	0.26	26.16	0.1%	13.1%	
M05	635539	169840	1.6	200	0.33	26.23	0.2%	13.1%	
M06	630254	169037	1.6	200	0.30	26.20	0.1%	13.1%	
M07	634445	164416	1.6	200	0.97	26.87	0.5%	13.4%	
M08	638492	165410	1.6	200	0.52	26.42	0.3%	13.2%	
M09	639097	165971	1.6	200	0.33	26.23	0.2%	13.1%	
M10	634662	166026	1.6	200	1.10	27.00	0.5%	13.5%	
M11	632984	166419	1.6	200	1.06	26.96	0.5%	13.5%	
M12	631161	165486	1.6	200	2.32	28.22	1.2%	14.1%	
M13	636570	167891	1.6	200	0.30	26.20	0.1%	13.1%	
M14	636405	168227	1.6	200	0.31	26.21	0.2%	13.1%	
M15	635932	165333	1.6	200	1.43	27.33	0.7%	13.7%	
M16	630438	169111	1.6	200	0.31	26.21	0.2%	13.1%	
M17	630186	168983	1.6	200	0.29	26.19	0.1%	13.1%	
M18	638616	165564	1.6	200	0.48	26.38	0.2%	13.2%	
M19	638472	165432	1.6	200	0.52	26.42	0.3%	13.2%	
M20	637135	165354	1.6	200	0.82	26.72	0.4%	13.4%	

Year 2. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
M21	636815	167297	1.6	200	0.34	26.24	0.2%	13.1%	
M22	638220	168614	1.6	200	0.21	26.11	0.1%	13.1%	
M23	637112	165331	1.6	200	0.83	26.73	0.4%	13.4%	
M24	638536	165465	1.6	200	0.50	26.40	0.3%	13.2%	
M25	637092	165340	1.6	200	0.83	26.73	0.4%	13.4%	
M26	638528	165426	1.6	200	0.51	26.41	0.3%	13.2%	

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of AQAL	Impact
H01	631215	166224	1.6	40	0.34	22.07	0.9%	55.2%	Negligible
H02	631165	166314	1.6	40	0.26	19.56	0.7%	48.9%	Negligible
H03	631186	166424	1.6	40	0.27	19.57	0.7%	48.9%	Negligible
H04	631003	166651	1.6	40	0.22	19.52	0.6%	48.8%	Negligible
H05	630864	166832	1.6	40	0.19	19.49	0.5%	48.7%	Negligible
H06	632086	166298	1.6	40	0.97	20.27	2.4%	50.7%	Negligible
H07	632159	166430	1.6	40	0.87	20.17	2.2%	50.4%	Negligible
H08	632489	166193	1.6	40	4.66	32.25	11.7%	80.6%	Moderate
H09	632629	166210	1.6	40	5.11	35.72	12.8%	89.3%	Moderate
H10	633019	166385	1.6	40	6.01	33.30	15.0%	83.3%	Moderate
H11	633039	166403	1.6	40	6.18	31.72	15.5%	79.3%	Moderate
H12	633126	166502	1.6	40	5.07	27.79	12.7%	69.5%	Moderate
H13	633285	166619	1.6	40	3.50	24.23	8.7%	60.6%	Slight
H14	633912	166981	1.6	40	2.33	24.77	5.8%	61.9%	Slight
H15	634183	166374	1.6	40	8.08	30.47	20.2%	76.2%	Moderate
H16	634509	166374	1.6	40	2.40	24.64	6.0%	61.6%	Slight
H17	634621	166241	1.6	40	2.11	31.04	5.3%	77.6%	Slight
H18	634640	166153	1.6	40	1.99	29.61	5.0%	74.0%	Negligible
H19	634680	166079	1.6	40	1.82	23.10	4.6%	57.7%	Negligible
H20	634651	165954	1.6	40	1.88	22.13	4.7%	55.3%	Negligible
H21	634584	165938	1.6	40	2.15	21.45	5.4%	53.6%	Negligible
H22	634694	165880	1.6	40	1.71	21.01	4.3%	52.5%	Negligible
H23	634455	165807	1.6	40	2.69	21.99	6.7%	55.0%	Slight
H24	635028	166030	1.6	40	1.10	28.72	2.7%	71.8%	Negligible
H25	635479	166321	1.6	40	0.62	19.92	1.5%	49.8%	Negligible
H26	635757	166282	1.6	40	0.49	19.79	1.2%	49.5%	Negligible
H27	636106	166044	1.6	40	0.38	19.68	0.9%	49.2%	Negligible
H28	636063	165787	1.6	40	0.40	26.51	1.0%	66.3%	Negligible
H29	635661	165661	1.6	40	0.50	19.80	1.3%	49.5%	Negligible
H30	635606	165627	1.6	40	0.52	19.82	1.3%	49.5%	Negligible
H31	635903	165323	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
H32	635777	165134	1.6	40	0.38	29.46	0.9%	73.6%	Negligible
H33	634774	165056	1.6	40	0.80	20.10	2.0%	50.2%	Negligible
H34	634770	165249	1.6	40	0.98	20.28	2.4%	50.7%	Negligible
H35	634726	165251	1.6	40	1.03	20.33	2.6%	50.8%	Negligible
H36	634682	165251	1.6	40	1.08	20.38	2.7%	50.9%	Negligible
H37	634646	165253	1.6	40	1.12	20.42	2.8%	51.1%	Negligible
H38	634602	165260	1.6	40	1.18	20.48	3.0%	51.2%	Negligible
H39	634603	165217	1.6	40	1.10	20.40	2.7%	51.0%	Negligible
H40	634601	165182	1.6	40	1.03	20.33	2.6%	50.8%	Negligible
H41	634599	165138	1.6	40	0.96	20.26	2.4%	50.7%	Negligible
H42	634596	165101	1.6	40	0.91	20.21	2.3%	50.5%	Negligible
H43	634450	165100	1.6	40	0.94	20.24	2.3%	50.6%	Negligible
H44	634382	165134	1.6	40	1.01	20.31	2.5%	50.8%	Negligible
H45	634518	164793	1.6	40	0.57	23.43	1.4%	58.6%	Negligible
H46	633418	164980	1.6	40	0.75	20.05	1.9%	50.1%	Negligible
H47	633287	164842	1.6	40	0.61	19.91	1.5%	49.8%	Negligible
H48	633076	164912	1.6	40	0.67	19.97	1.7%	49.9%	Negligible
H49	632465	165443	1.6	40	1.21	25.49	3.0%	63.7%	Negligible
H50	632426	165384	1.6	40	1.09	23.37	2.7%	58.4%	Negligible
H51	632378	165324	1.6	40	0.97	20.27	2.4%	50.7%	Negligible
H52	632242	165162	1.6	40	0.75	20.05	1.9%	50.1%	Negligible
H53	632166	165091	1.6	40	0.67	19.97	1.7%	49.9%	Negligible
H54	632064	165515	1.6	40	0.92	26.75	2.3%	66.9%	Negligible
H55	632023	165273	1.6	40	0.68	19.98	1.7%	50.0%	Negligible
H56	631079	165231	1.6	40	0.31	19.61	0.8%	49.0%	Negligible
H57	630849	165341	1.6	40	0.26	19.56	0.6%	48.9%	Negligible
H58	631238	165328	1.6	40	0.36	19.66	0.9%	49.2%	Negligible
H59	631258	165433	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
H60	631203	165516	1.6	40	0.35	22.13	0.9%	55.3%	Negligible
H61	631139	165561	1.6	40	0.33	22.68	0.8%	56.7%	Negligible
H62	631045	165700	1.6	40	0.27	28.29	0.7%	70.7%	Negligible
H63	631091	165778	1.6	40	0.26	19.56	0.6%	48.9%	Negligible
H64	631111	165805	1.6	40	0.65	27.41	1.6%	68.5%	Negligible
H65	631115	165852	1.6	40	0.49	28.62	1.2%	71.6%	Negligible
H66	631061	165470	1.6	40	0.30	19.60	0.8%	49.0%	Negligible
H67	634597	166287	1.6	40	2.05	21.35	5.1%	53.4%	Negligible
H68	635335	165657	1.6	40	0.66	19.96	1.6%	49.9%	Negligible
H69	634417	165213	1.6	40	1.19	20.49	3.0%	51.2%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of AQAL	Impact
H70	631268	165516	1.6	40	0.38	22.46	1.0%	56.1%	Negligible
A01	628199	169135	1.6	40	0.06	19.36	0.2%	48.4%	Negligible
A02	629810	168213	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
A03	630337	168165	1.6	40	0.14	19.44	0.3%	48.6%	Negligible
A04	631554	168915	1.6	40	0.16	19.46	0.4%	48.6%	Negligible
A05	632410	169167	1.6	40	0.17	19.47	0.4%	48.7%	Negligible
A06	633542	169294	1.6	40	0.22	19.52	0.5%	48.8%	Negligible
A07	635052	169313	1.6	40	0.18	19.48	0.4%	48.7%	Negligible
A08	635998	168591	1.6	40	0.20	19.50	0.5%	48.8%	Negligible
A09	635909	167560	1.6	40	0.30	19.60	0.8%	49.0%	Negligible
A10	635754	166743	1.6	40	0.43	19.73	1.1%	49.3%	Negligible
A11	635574	165975	1.6	40	0.57	19.87	1.4%	49.7%	Negligible
A12	635125	165203	1.6	40	0.66	19.96	1.7%	49.9%	Negligible
A13	634752	165243	1.6	40	0.99	20.29	2.5%	50.7%	Negligible
A14	634369	165285	1.6	40	1.47	20.77	3.7%	51.9%	Negligible
A15	634356	165091	1.6	40	0.92	20.22	2.3%	50.6%	Negligible
A16	634362	164473	1.6	40	0.38	19.68	0.9%	49.2%	Negligible
A17	634276	164112	1.6	40	0.26	19.56	0.6%	48.9%	Negligible
A18	634556	163810	1.6	40	0.21	19.51	0.5%	48.8%	Negligible
A19	634834	164066	1.6	40	0.27	19.57	0.7%	48.9%	Negligible
A20	635064	163939	1.6	40	0.25	19.55	0.6%	48.9%	Negligible
A21	635416	164358	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
A22	630226	169070	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A23	630235	169089	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A24	630253	169081	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A25	630270	169076	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A26	630288	169071	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A27	630308	169071	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A28	630308	169058	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A29	630290	169050	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A30	630276	169045	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A31	630254	169033	1.6	40	0.11	35.41	0.3%	88.5%	Negligible
A32	637052	165324	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A33	637046	165372	1.6	40	0.22	38.22	0.5%	95.5%	Slight
A34	637074	165376	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A35	637065	165340	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A36	637075	165331	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A37	637104	165345	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A38	637140	165328	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A39	637119	165323	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A40	637099	165327	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A41	637082	165319	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A42	637085	165289	1.6	40	0.21	38.21	0.5%	95.5%	Slight
A43	637063	165280	1.6	40	0.21	38.21	0.5%	95.5%	Slight
M01	635931	165331	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
M02	638483	165430	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M03	630284	169052	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M04	639019	167981	1.6	40	0.08	19.38	0.2%	48.5%	Negligible
M05	635539	169840	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M06	630254	169037	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M07	634445	164416	1.6	40	0.36	19.66	0.9%	49.2%	Negligible
M08	638492	165410	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M09	639097	165971	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M10	634662	166026	1.6	40	1.86	21.16	4.7%	52.9%	Negligible
M11	632984	166419	1.6	40	4.15	23.45	10.4%	58.6%	Moderate
M12	631161	165486	1.6	40	0.33	19.63	0.8%	49.1%	Negligible
M13	636570	167891	1.6	40	0.20	19.50	0.5%	48.8%	Negligible
M14	636405	168227	1.6	40	0.21	19.51	0.5%	48.8%	Negligible
M15	635932	165333	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
M16	630438	169111	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M17	630186	168983	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M18	638616	165564	1.6	40	0.12	19.42	0.3%	48.6%	Negligible
M19	638472	165432	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M20	637135	165354	1.6	40	0.21	19.51	0.5%	48.8%	Negligible
M21	636815	167297	1.6	40	0.19	19.49	0.5%	48.7%	Negligible
M22	638220	168614	1.6	40	0.10	19.40	0.2%	48.5%	Negligible
M23	637112	165331	1.6	40	0.21	19.51	0.5%	48.8%	Negligible
M24	638536	165465	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M25	637092	165340	1.6	40	0.21	19.51	0.5%	48.8%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of AQAL	Impact
M26	638528	165426	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
M27	634752	170679	1.6	40	0.11	19.41	0.3%	48.5%	Negligible

Year 2. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	200	1.25	20.55	0.6%	10.3%	
H02	631165	166314	1.6	200	1.05	20.35	0.5%	10.2%	
H03	631186	166424	1.6	200	1.36	20.66	0.7%	10.3%	
H04	631003	166651	1.6	200	1.32	20.62	0.7%	10.3%	
H05	630864	166832	1.6	200	1.09	20.39	0.5%	10.2%	
H06	632086	166298	1.6	200	1.53	20.83	0.8%	10.4%	
H07	632159	166430	1.6	200	1.29	20.59	0.6%	10.3%	
H08	632489	166193	1.6	200	1.08	20.38	0.5%	10.2%	
H09	632629	166210	1.6	200	1.05	20.35	0.5%	10.2%	
H10	633019	166385	1.6	200	1.19	20.49	0.6%	10.2%	
H11	633039	166403	1.6	200	1.32	20.62	0.7%	10.3%	
H12	633126	166502	1.6	200	1.30	20.60	0.6%	10.3%	
H13	633285	166619	1.6	200	1.06	20.36	0.5%	10.2%	
H14	633912	166981	1.6	200	0.96	20.26	0.5%	10.1%	
H15	634183	166374	1.6	200	1.30	20.60	0.6%	10.3%	
H16	634509	166374	1.6	200	1.52	20.82	0.8%	10.4%	
H17	634621	166241	1.6	200	1.54	20.84	0.8%	10.4%	
H18	634640	166153	1.6	200	1.54	20.84	0.8%	10.4%	
H19	634680	166079	1.6	200	1.64	20.94	0.8%	10.5%	
H20	634651	165954	1.6	200	1.84	21.14	0.9%	10.6%	
H21	634584	165938	1.6	200	1.98	21.28	1.0%	10.6%	
H22	634694	165880	1.6	200	1.67	20.97	0.8%	10.5%	
H23	634455	165807	1.6	200	2.12	21.42	1.1%	10.7%	
H24	635028	166030	1.6	200	1.53	20.83	0.8%	10.4%	
H25	635479	166321	1.6	200	1.19	20.49	0.6%	10.2%	
H26	635757	166282	1.6	200	1.19	20.49	0.6%	10.2%	
H27	636106	166044	1.6	200	1.27	20.57	0.6%	10.3%	
H28	636063	165787	1.6	200	1.25	20.55	0.6%	10.3%	
H29	635661	165661	1.6	200	1.82	21.12	0.9%	10.6%	
H30	635606	165627	1.6	200	1.80	21.10	0.9%	10.6%	
H31	635903	165323	1.6	200	1.75	21.05	0.9%	10.5%	
H32	635777	165134	1.6	200	2.00	21.30	1.0%	10.7%	
H33	634774	165056	1.6	200	3.18	22.48	1.6%	11.2%	
H34	634770	165249	1.6	200	4.08	23.38	2.0%	11.7%	
H35	634726	165251	1.6	200	3.90	23.20	1.9%	11.6%	
H36	634682	165251	1.6	200	4.49	23.79	2.2%	11.9%	
H37	634646	165253	1.6	200	4.36	23.66	2.2%	11.8%	
H38	634602	165260	1.6	200	4.13	23.43	2.1%	11.7%	
H39	634603	165217	1.6	200	3.85	23.15	1.9%	11.6%	
H40	634601	165182	1.6	200	3.44	22.74	1.7%	11.4%	
H41	634599	165138	1.6	200	3.08	22.38	1.5%	11.2%	
H42	634596	165101	1.6	200	2.89	22.19	1.4%	11.1%	
H43	634450	165100	1.6	200	2.58	21.88	1.3%	10.9%	
H44	634382	165134	1.6	200	2.77	22.07	1.4%	11.0%	
H45	634518	164793	1.6	200	1.91	21.21	1.0%	10.6%	
H46	633418	164980	1.6	200	1.08	20.38	0.5%	10.2%	
H47	633287	164842	1.6	200	1.04	20.34	0.5%	10.2%	
H48	633076	164912	1.6	200	0.94	20.24	0.5%	10.1%	
H49	632465	165443	1.6	200	1.54	20.84	0.8%	10.4%	

Year 2. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H50	632426	165384	1.6	200	1.55	20.85	0.8%	10.4%	
H51	632378	165324	1.6	200	1.54	20.84	0.8%	10.4%	
H52	632242	165162	1.6	200	1.35	20.65	0.7%	10.3%	
H53	632166	165091	1.6	200	1.24	20.54	0.6%	10.3%	
H54	632064	165515	1.6	200	1.77	21.07	0.9%	10.5%	
H55	632023	165273	1.6	200	1.47	20.77	0.7%	10.4%	
H56	631079	165231	1.6	200	1.95	21.25	1.0%	10.6%	
H57	630849	165341	1.6	200	2.02	21.32	1.0%	10.7%	
H58	631238	165328	1.6	200	2.24	21.54	1.1%	10.8%	
H59	631258	165433	1.6	200	2.48	21.78	1.2%	10.9%	
H60	631203	165516	1.6	200	2.45	21.75	1.2%	10.9%	
H61	631139	165561	1.6	200	2.65	21.95	1.3%	11.0%	
H62	631045	165700	1.6	200	3.08	22.38	1.5%	11.2%	
H63	631091	165778	1.6	200	2.70	22.00	1.4%	11.0%	
H64	631111	165805	1.6	200	2.88	22.18	1.4%	11.1%	
H65	631115	165852	1.6	200	2.76	22.06	1.4%	11.0%	
H66	631061	165470	1.6	200	2.28	21.58	1.1%	10.8%	
H67	634597	166287	1.6	200	1.44	20.74	0.7%	10.4%	
H68	635335	165657	1.6	200	2.03	21.33	1.0%	10.7%	
H69	634417	165213	1.6	200	3.22	22.52	1.6%	11.3%	
H70	631268	165516	1.6	200	2.86	22.16	1.4%	11.1%	
S01	633172	166482	1.6	200	1.27	20.57	0.6%	10.3%	
S02	633258	166471	1.6	200	1.21	20.51	0.6%	10.3%	
S03	633351	166555	1.6	200	1.16	20.46	0.6%	10.2%	
S04	634633	165956	1.6	200	1.89	21.19	0.9%	10.6%	
S05	635743	166131	1.6	200	1.34	20.64	0.7%	10.3%	
S06	636110	165647	1.6	200	1.33	20.63	0.7%	10.3%	
S07	631121	165603	1.6	200	2.72	22.02	1.4%	11.0%	
S08	631189	165670	1.6	200	3.50	22.80	1.8%	11.4%	
A01	628199	169135	1.6	200	0.28	19.58	0.1%	9.8%	
A02	629810	168213	1.6	200	0.68	19.98	0.3%	10.0%	
A03	630337	168165	1.6	200	0.63	19.93	0.3%	10.0%	
A04	631554	168915	1.6	200	0.81	20.11	0.4%	10.1%	
A05	632410	169167	1.6	200	0.79	20.09	0.4%	10.0%	
A06	633542	169294	1.6	200	0.64	19.94	0.3%	10.0%	
A07	635052	169313	1.6	200	0.64	19.94	0.3%	10.0%	
A08	635998	168591	1.6	200	0.56	19.86	0.3%	9.9%	
A09	635909	167560	1.6	200	0.71	20.01	0.4%	10.0%	
A10	635754	166743	1.6	200	1.04	20.34	0.5%	10.2%	
A11	635574	165975	1.6	200	1.39	20.69	0.7%	10.3%	
A12	635125	165203	1.6	200	3.48	22.78	1.7%	11.4%	
A13	634752	165243	1.6	200	3.91	23.21	2.0%	11.6%	
A14	634369	165285	1.6	200	3.41	22.71	1.7%	11.4%	
A15	634356	165091	1.6	200	2.58	21.88	1.3%	10.9%	
A16	634362	164473	1.6	200	1.45	20.75	0.7%	10.4%	
A17	634276	164112	1.6	200	1.17	20.47	0.6%	10.2%	
A18	634556	163810	1.6	200	1.15	20.45	0.6%	10.2%	
A19	634834	164066	1.6	200	1.21	20.51	0.6%	10.3%	
A20	635064	163939	1.6	200	1.31	20.61	0.7%	10.3%	

Year 2. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A21	635416	164358	1.6	200	1.92	21.22	1.0%	10.6%	
A22	630226	169070	1.6	200	0.57	35.87	0.3%	17.9%	
A23	630235	169089	1.6	200	0.57	35.87	0.3%	17.9%	
A24	630253	169081	1.6	200	0.57	35.87	0.3%	17.9%	
A25	630270	169076	1.6	200	0.58	35.88	0.3%	17.9%	
A26	630288	169071	1.6	200	0.59	35.89	0.3%	17.9%	
A27	630308	169071	1.6	200	0.61	35.91	0.3%	18.0%	
A28	630308	169058	1.6	200	0.61	35.91	0.3%	18.0%	
A29	630290	169050	1.6	200	0.59	35.89	0.3%	17.9%	
A30	630276	169045	1.6	200	0.58	35.88	0.3%	17.9%	
A31	630254	169033	1.6	200	0.57	35.87	0.3%	17.9%	
A32	637052	165324	1.6	200	1.17	39.17	0.6%	19.6%	
A33	637046	165372	1.6	200	1.17	39.17	0.6%	19.6%	
A34	637074	165376	1.6	200	1.15	39.15	0.6%	19.6%	
A35	637065	165340	1.6	200	1.18	39.18	0.6%	19.6%	
A36	637075	165331	1.6	200	1.18	39.18	0.6%	19.6%	
A37	637104	165345	1.6	200	1.16	39.16	0.6%	19.6%	
A38	637140	165328	1.6	200	1.15	39.15	0.6%	19.6%	
A39	637119	165323	1.6	200	1.15	39.15	0.6%	19.6%	
A40	637099	165327	1.6	200	1.16	39.16	0.6%	19.6%	
A41	637082	165319	1.6	200	1.16	39.16	0.6%	19.6%	
A42	637085	165289	1.6	200	1.11	39.11	0.6%	19.6%	
A43	637063	165280	1.6	200	1.10	39.10	0.6%	19.6%	
M01	635931	165331	1.6	200	1.70	21.00	0.8%	10.5%	
M02	638483	165430	1.6	200	0.72	20.02	0.4%	10.0%	
M03	630284	169052	1.6	200	0.58	19.88	0.3%	9.9%	
M04	639019	167981	1.6	200	0.46	19.76	0.2%	9.9%	
M05	635539	169840	1.6	200	0.57	19.87	0.3%	9.9%	
M06	630254	169037	1.6	200	0.57	19.87	0.3%	9.9%	
M07	634445	164416	1.6	200	1.51	20.81	0.8%	10.4%	
M08	638492	165410	1.6	200	0.72	20.02	0.4%	10.0%	
M09	639097	165971	1.6	200	0.48	19.78	0.2%	9.9%	
M10	634662	166026	1.6	200	1.77	21.07	0.9%	10.5%	
M11	632984	166419	1.6	200	1.18	20.48	0.6%	10.2%	
M12	631161	165486	1.6	200	2.46	21.76	1.2%	10.9%	
M13	636570	167891	1.6	200	0.64	19.94	0.3%	10.0%	
M14	636405	168227	1.6	200	0.58	19.88	0.3%	9.9%	
M15	635932	165333	1.6	200	1.69	20.99	0.8%	10.5%	
M16	630438	169111	1.6	200	0.61	19.91	0.3%	10.0%	
M17	630186	168983	1.6	200	0.56	19.86	0.3%	9.9%	
M18	638616	165564	1.6	200	0.58	19.88	0.3%	9.9%	
M19	638472	165432	1.6	200	0.72	20.02	0.4%	10.0%	
M20	637135	165354	1.6	200	1.15	20.45	0.6%	10.2%	
M21	636815	167297	1.6	200	0.68	19.98	0.3%	10.0%	
M22	638220	168614	1.6	200	0.35	19.65	0.2%	9.8%	
M23	637112	165331	1.6	200	1.16	20.46	0.6%	10.2%	
M24	638536	165465	1.6	200	0.68	19.98	0.3%	10.0%	
M25	637092	165340	1.6	200	1.17	20.47	0.6%	10.2%	
M26	638528	165426	1.6	200	0.71	20.01	0.4%	10.0%	

Year 2. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	200	0.59	19.89	0.3%	9.9%	

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	40	0.01	18.74	0.0%	46.8%	Negligible
H02	631165	166314	1.6	40	0.01	18.46	0.0%	46.1%	Negligible
H03	631186	166424	1.6	40	0.01	18.46	0.0%	46.1%	Negligible
H04	631003	166651	1.6	40	0.01	18.46	0.0%	46.1%	Negligible
H05	630864	166832	1.6	40	0.01	16.90	0.0%	42.3%	Negligible
H06	632086	166298	1.6	40	0.03	16.00	0.1%	40.0%	Negligible
H07	632159	166430	1.6	40	0.03	15.99	0.1%	40.0%	Negligible
H08	632489	166193	1.6	40	0.11	17.04	0.3%	42.6%	Negligible
H09	632629	166210	1.6	40	0.14	17.43	0.3%	43.6%	Negligible
H10	633019	166385	1.6	40	0.12	15.71	0.3%	39.3%	Negligible
H11	633039	166403	1.6	40	0.13	15.51	0.3%	38.8%	Negligible
H12	633126	166502	1.6	40	0.10	15.15	0.3%	37.9%	Negligible
H13	633285	166619	1.6	40	0.07	14.91	0.2%	37.3%	Negligible
H14	633912	166981	1.6	40	0.05	15.10	0.1%	37.7%	Negligible
H15	634183	166374	1.6	40	0.15	16.25	0.4%	40.6%	Negligible
H16	634509	166374	1.6	40	0.05	16.13	0.1%	40.3%	Negligible
H17	634621	166241	1.6	40	0.07	16.98	0.2%	42.4%	Negligible
H18	634640	166153	1.6	40	0.06	16.80	0.1%	42.0%	Negligible
H19	634680	166079	1.6	40	0.05	16.01	0.1%	40.0%	Negligible
H20	634651	165954	1.6	40	0.05	15.85	0.1%	39.6%	Negligible
H21	634584	165938	1.6	40	0.06	15.74	0.1%	39.4%	Negligible
H22	634694	165880	1.6	40	0.04	15.73	0.1%	39.3%	Negligible
H23	634455	165807	1.6	40	0.08	15.76	0.2%	39.4%	Negligible
H24	635028	166030	1.6	40	0.03	17.66	0.1%	44.1%	Negligible
H25	635479	166321	1.6	40	0.01	16.62	0.0%	41.5%	Negligible
H26	635757	166282	1.6	40	0.01	16.62	0.0%	41.5%	Negligible
H27	636106	166044	1.6	40	0.01	15.23	0.0%	38.1%	Negligible
H28	636063	165787	1.6	40	0.01	16.13	0.0%	40.3%	Negligible
H29	635661	165661	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
H30	635606	165627	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
H31	635903	165323	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
H32	635777	165134	1.6	40	0.01	18.22	0.0%	45.5%	Negligible
H33	634774	165056	1.6	40	0.02	15.71	0.1%	39.3%	Negligible
H34	634770	165249	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H35	634726	165251	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H36	634682	165251	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H37	634646	165253	1.6	40	0.03	15.72	0.1%	39.3%	Negligible
H38	634602	165260	1.6	40	0.03	15.72	0.1%	39.3%	Negligible
H39	634603	165217	1.6	40	0.03	15.72	0.1%	39.3%	Negligible
H40	634601	165182	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H41	634599	165138	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H42	634596	165101	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H43	634450	165100	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
H44	634382	165134	1.6	40	0.03	15.72	0.1%	39.3%	Negligible
H45	634518	164793	1.6	40	0.02	16.19	0.0%	40.5%	Negligible
H46	633418	164980	1.6	40	0.01	16.50	0.0%	41.2%	Negligible
H47	633287	164842	1.6	40	0.01	16.50	0.0%	41.2%	Negligible
H48	633076	164912	1.6	40	0.01	16.50	0.0%	41.2%	Negligible
H49	632465	165443	1.6	40	0.02	16.94	0.1%	42.3%	Negligible
H50	632426	165384	1.6	40	0.02	16.72	0.1%	41.8%	Negligible
H51	632378	165324	1.6	40	0.02	16.41	0.0%	41.0%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H52	632242	165162	1.6	40	0.02	16.41	0.0%	41.0%	Negligible
H53	632166	165091	1.6	40	0.02	16.41	0.0%	41.0%	Negligible
H54	632064	165515	1.6	40	0.05	17.13	0.1%	42.8%	Negligible
H55	632023	165273	1.6	40	0.02	16.41	0.1%	41.0%	Negligible
H56	631079	165231	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
H57	630849	165341	1.6	40	0.01	16.46	0.0%	41.1%	Negligible
H58	631238	165328	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
H59	631258	165433	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
H60	631203	165516	1.6	40	0.01	17.12	0.0%	42.8%	Negligible
H61	631139	165561	1.6	40	0.01	17.18	0.0%	43.0%	Negligible
H62	631045	165700	1.6	40	0.01	17.79	0.0%	44.5%	Negligible
H63	631091	165778	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
H64	631111	165805	1.6	40	0.04	17.76	0.1%	44.4%	Negligible
H65	631115	165852	1.6	40	0.03	17.91	0.1%	44.8%	Negligible
H66	631061	165470	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
H67	634597	166287	1.6	40	0.05	15.77	0.1%	39.4%	Negligible
H68	635335	165657	1.6	40	0.02	16.93	0.0%	42.3%	Negligible
H69	634417	165213	1.6	40	0.04	15.72	0.1%	39.3%	Negligible
H70	631268	165516	1.6	40	0.01	17.15	0.0%	42.9%	Negligible
A01	628199	169135	1.6	40	0.00	14.28	0.0%	35.7%	Negligible
A02	629810	168213	1.6	40	0.00	15.97	0.0%	39.9%	Negligible
A03	630337	168165	1.6	40	0.00	15.53	0.0%	38.8%	Negligible
A04	631554	168915	1.6	40	0.00	16.38	0.0%	41.0%	Negligible
A05	632410	169167	1.6	40	0.00	15.44	0.0%	38.6%	Negligible
A06	633542	169294	1.6	40	0.00	15.71	0.0%	39.3%	Negligible
A07	635052	169313	1.6	40	0.00	14.75	0.0%	36.9%	Negligible
A08	635998	168591	1.6	40	0.01	16.04	0.0%	40.1%	Negligible
A09	635909	167560	1.6	40	0.01	16.55	0.0%	41.4%	Negligible
A10	635754	166743	1.6	40	0.01	16.61	0.0%	41.5%	Negligible
A11	635574	165975	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
A12	635125	165203	1.6	40	0.02	16.93	0.0%	42.3%	Negligible
A13	634752	165243	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
A14	634369	165285	1.6	40	0.05	15.74	0.1%	39.3%	Negligible
A15	634356	165091	1.6	40	0.03	15.71	0.1%	39.3%	Negligible
A16	634362	164473	1.6	40	0.01	15.73	0.0%	39.3%	Negligible
A17	634276	164112	1.6	40	0.01	15.72	0.0%	39.3%	Negligible
A18	634556	163810	1.6	40	0.01	14.49	0.0%	36.2%	Negligible
A19	634834	164066	1.6	40	0.01	15.72	0.0%	39.3%	Negligible
A20	635064	163939	1.6	40	0.01	13.87	0.0%	34.7%	Negligible
A21	635416	164358	1.6	40	0.01	15.86	0.0%	39.7%	Negligible
A22	630226	169070	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A23	630235	169089	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A24	630253	169081	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A25	630270	169076	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A26	630288	169071	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A27	630308	169071	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A28	630308	169058	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A29	630290	169050	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A30	630276	169045	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A31	630254	169033	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
A32	637052	165324	1.6	40	0.01	15.12	0.0%	37.8%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A33	637046	165372	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A34	637074	165376	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A35	637065	165340	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A36	637075	165331	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A37	637104	165345	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A38	637140	165328	1.6	40	0.00	15.12	0.0%	37.8%	Negligible
A39	637119	165323	1.6	40	0.00	15.12	0.0%	37.8%	Negligible
A40	637099	165327	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A41	637082	165319	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A42	637085	165289	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
A43	637063	165280	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
M01	635931	165331	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
M02	638483	165430	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M03	630284	169052	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
M04	639019	167981	1.6	40	0.00	14.69	0.0%	36.7%	Negligible
M05	635539	169840	1.6	40	0.00	14.75	0.0%	36.9%	Negligible
M06	630254	169037	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
M07	634445	164416	1.6	40	0.01	15.73	0.0%	39.3%	Negligible
M08	638492	165410	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M09	639097	165971	1.6	40	0.00	13.71	0.0%	34.3%	Negligible
M10	634662	166026	1.6	40	0.05	15.77	0.1%	39.4%	Negligible
M11	632984	166419	1.6	40	0.08	16.04	0.2%	40.1%	Negligible
M12	631161	165486	1.6	40	0.01	16.86	0.0%	42.2%	Negligible
M13	636570	167891	1.6	40	0.01	16.16	0.0%	40.4%	Negligible
M14	636405	168227	1.6	40	0.01	16.57	0.0%	41.4%	Negligible
M15	635932	165333	1.6	40	0.01	16.92	0.0%	42.3%	Negligible
M16	630438	169111	1.6	40	0.00	14.62	0.0%	36.5%	Negligible
M17	630186	168983	1.6	40	0.00	15.53	0.0%	38.8%	Negligible
M18	638616	165564	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M19	638472	165432	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M20	637135	165354	1.6	40	0.00	15.12	0.0%	37.8%	Negligible
M21	636815	167297	1.6	40	0.00	16.16	0.0%	40.4%	Negligible
M22	638220	168614	1.6	40	0.00	14.99	0.0%	37.5%	Negligible
M23	637112	165331	1.6	40	0.00	15.12	0.0%	37.8%	Negligible
M24	638536	165465	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M25	637092	165340	1.6	40	0.01	15.12	0.0%	37.8%	Negligible
M26	638528	165426	1.6	40	0.00	14.88	0.0%	37.2%	Negligible
M27	634752	170679	1.6	40	0.00	14.50	0.0%	36.3%	Negligible

Year 2. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
H01	631215	166224	1.6	35	2	5.8%	
H02	631165	166314	1.6	35	2	5.1%	
H03	631186	166424	1.6	35	2	5.1%	
H04	631003	166651	1.6	35	2	5.1%	
H05	630864	166832	1.6	35	1	2.0%	
H06	632086	166298	1.6	35	0	0.9%	
H07	632159	166430	1.6	35	0	0.9%	
H08	632489	166193	1.6	35	1	2.2%	
H09	632629	166210	1.6	35	1	2.9%	
H10	633019	166385	1.6	35	0	0.7%	
H11	633039	166403	1.6	35	0	0.5%	
H12	633126	166502	1.6	35	0	0.4%	
H13	633285	166619	1.6	35	0	0.3%	
H14	633912	166981	1.6	35	0	0.4%	
H15	634183	166374	1.6	35	0	1.1%	
H16	634509	166374	1.6	35	0	1.0%	
H17	634621	166241	1.6	35	1	2.1%	
H18	634640	166153	1.6	35	1	1.8%	
H19	634680	166079	1.6	35	0	0.9%	
H20	634651	165954	1.6	35	0	0.8%	
H21	634584	165938	1.6	35	0	0.7%	
H22	634694	165880	1.6	35	0	0.7%	
H23	634455	165807	1.6	35	0	0.7%	
H24	635028	166030	1.6	35	1	3.3%	
H25	635479	166321	1.6	35	1	1.6%	
H26	635757	166282	1.6	35	1	1.6%	
H27	636106	166044	1.6	35	0	0.4%	
H28	636063	165787	1.6	35	0	1.0%	
H29	635661	165661	1.6	35	1	2.0%	
H30	635606	165627	1.6	35	1	2.0%	
H31	635903	165323	1.6	35	1	2.0%	
H32	635777	165134	1.6	35	2	4.5%	
H33	634774	165056	1.6	35	0	0.7%	
H34	634770	165249	1.6	35	0	0.7%	
H35	634726	165251	1.6	35	0	0.7%	
H36	634682	165251	1.6	35	0	0.7%	
H37	634646	165253	1.6	35	0	0.7%	
H38	634602	165260	1.6	35	0	0.7%	
H39	634603	165217	1.6	35	0	0.7%	
H40	634601	165182	1.6	35	0	0.7%	
H41	634599	165138	1.6	35	0	0.7%	
H42	634596	165101	1.6	35	0	0.7%	
H43	634450	165100	1.6	35	0	0.7%	
H44	634382	165134	1.6	35	0	0.7%	
H45	634518	164793	1.6	35	0	1.1%	
H46	633418	164980	1.6	35	0	1.4%	
H47	633287	164842	1.6	35	0	1.4%	
H48	633076	164912	1.6	35	0	1.4%	
H49	632465	165443	1.6	35	1	2.0%	

Year 2. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
H50	632426	165384	1.6	35	1	1.7%	
H51	632378	165324	1.6	35	0	1.3%	
H52	632242	165162	1.6	35	0	1.3%	
H53	632166	165091	1.6	35	0	1.3%	
H54	632064	165515	1.6	35	1	2.3%	
H55	632023	165273	1.6	35	0	1.3%	
H56	631079	165231	1.6	35	1	1.9%	
H57	630849	165341	1.6	35	0	1.4%	
H58	631238	165328	1.6	35	1	1.9%	
H59	631258	165433	1.6	35	1	1.9%	
H60	631203	165516	1.6	35	1	2.3%	
H61	631139	165561	1.6	35	1	2.4%	
H62	631045	165700	1.6	35	1	3.6%	
H63	631091	165778	1.6	35	1	1.9%	
H64	631111	165805	1.6	35	1	3.5%	
H65	631115	165852	1.6	35	1	3.8%	
H66	631061	165470	1.6	35	1	1.9%	
H67	634597	166287	1.6	35	0	0.7%	
H68	635335	165657	1.6	35	1	2.0%	
H69	634417	165213	1.6	35	0	0.7%	
H70	631268	165516	1.6	35	1	2.4%	
S01	633172	166482	1.6	35	0	0.3%	
S02	633258	166471	1.6	35	0	0.3%	
S03	633351	166555	1.6	35	0	0.3%	
S04	634633	165956	1.6	35	0	0.7%	
S05	635743	166131	1.6	35	1	1.6%	
S06	636110	165647	1.6	35	0	0.4%	
S07	631121	165603	1.6	35	1	1.9%	
S08	631189	165670	1.6	35	1	1.9%	
A01	628199	169135	1.6	35	0	0.4%	
A02	629810	168213	1.6	35	0	0.9%	
A03	630337	168165	1.6	35	0	0.6%	
A04	631554	168915	1.6	35	0	1.3%	
A05	632410	169167	1.6	35	0	0.5%	
A06	633542	169294	1.6	35	0	0.7%	
A07	635052	169313	1.6	35	0	0.3%	
A08	635998	168591	1.6	35	0	0.9%	
A09	635909	167560	1.6	35	1	1.5%	
A10	635754	166743	1.6	35	1	1.6%	
A11	635574	165975	1.6	35	1	2.0%	
A12	635125	165203	1.6	35	1	2.0%	
A13	634752	165243	1.6	35	0	0.7%	
A14	634369	165285	1.6	35	0	0.7%	
A15	634356	165091	1.6	35	0	0.7%	
A16	634362	164473	1.6	35	0	0.7%	
A17	634276	164112	1.6	35	0	0.7%	
A18	634556	163810	1.6	35	0	0.4%	
A19	634834	164066	1.6	35	0	0.7%	
A20	635064	163939	1.6	35	0	0.6%	

Year 2. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
A21	635416	164358	1.6	35	0	0.8%	
A22	630226	169070	1.6	35	0	0.3%	
A23	630235	169089	1.6	35	0	0.3%	
A24	630253	169081	1.6	35	0	0.3%	
A25	630270	169076	1.6	35	0	0.3%	
A26	630288	169071	1.6	35	0	0.3%	
A27	630308	169071	1.6	35	0	0.3%	
A28	630308	169058	1.6	35	0	0.3%	
A29	630290	169050	1.6	35	0	0.3%	
A30	630276	169045	1.6	35	0	0.3%	
A31	630254	169033	1.6	35	0	0.3%	
A32	637052	165324	1.6	35	0	0.4%	
A33	637046	165372	1.6	35	0	0.4%	
A34	637074	165376	1.6	35	0	0.4%	
A35	637065	165340	1.6	35	0	0.4%	
A36	637075	165331	1.6	35	0	0.4%	
A37	637104	165345	1.6	35	0	0.4%	
A38	637140	165328	1.6	35	0	0.4%	
A39	637119	165323	1.6	35	0	0.4%	
A40	637099	165327	1.6	35	0	0.4%	
A41	637082	165319	1.6	35	0	0.4%	
A42	637085	165289	1.6	35	0	0.4%	
A43	637063	165280	1.6	35	0	0.4%	
M01	635931	165331	1.6	35	1	2.0%	
M02	638483	165430	1.6	35	0	0.3%	
M03	630284	169052	1.6	35	0	0.3%	
M04	639019	167981	1.6	35	0	0.3%	
M05	635539	169840	1.6	35	0	0.3%	
M06	630254	169037	1.6	35	0	0.3%	
M07	634445	164416	1.6	35	0	0.7%	
M08	638492	165410	1.6	35	0	0.3%	
M09	639097	165971	1.6	35	0	0.7%	
M10	634662	166026	1.6	35	0	0.7%	
M11	632984	166419	1.6	35	0	0.9%	
M12	631161	165486	1.6	35	1	1.9%	
M13	636570	167891	1.6	35	0	1.1%	
M14	636405	168227	1.6	35	1	1.5%	
M15	635932	165333	1.6	35	1	2.0%	
M16	630438	169111	1.6	35	0	0.3%	
M17	630186	168983	1.6	35	0	0.6%	
M18	638616	165564	1.6	35	0	0.3%	
M19	638472	165432	1.6	35	0	0.3%	
M20	637135	165354	1.6	35	0	0.4%	
M21	636815	167297	1.6	35	0	1.1%	
M22	638220	168614	1.6	35	0	0.4%	
M23	637112	165331	1.6	35	0	0.4%	
M24	638536	165465	1.6	35	0	0.3%	
M25	637092	165340	1.6	35	0	0.4%	
M26	638528	165426	1.6	35	0	0.3%	

Year 2. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
M27	634752	170679	1.6	35	0	0.4%	

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	25	0.01	12.89	0.0%	51.6%	Negligible
H02	631165	166314	1.6	25	0.01	12.73	0.0%	50.9%	Negligible
H03	631186	166424	1.6	25	0.01	12.73	0.0%	50.9%	Negligible
H04	631003	166651	1.6	25	0.01	12.73	0.0%	50.9%	Negligible
H05	630864	166832	1.6	25	0.00	11.51	0.0%	46.0%	Negligible
H06	632086	166298	1.6	25	0.03	11.16	0.1%	44.7%	Negligible
H07	632159	166430	1.6	25	0.02	11.16	0.1%	44.6%	Negligible
H08	632489	166193	1.6	25	0.10	11.79	0.4%	47.2%	Negligible
H09	632629	166210	1.6	25	0.11	12.03	0.4%	48.1%	Negligible
H10	633019	166385	1.6	25	0.11	11.11	0.5%	44.4%	Negligible
H11	633039	166403	1.6	25	0.12	10.99	0.5%	44.0%	Negligible
H12	633126	166502	1.6	25	0.10	10.78	0.4%	43.1%	Negligible
H13	633285	166619	1.6	25	0.07	10.63	0.3%	42.5%	Negligible
H14	633912	166981	1.6	25	0.04	10.73	0.2%	42.9%	Negligible
H15	634183	166374	1.6	25	0.15	11.37	0.6%	45.5%	Negligible
H16	634509	166374	1.6	25	0.05	11.26	0.2%	45.0%	Negligible
H17	634621	166241	1.6	25	0.06	11.76	0.2%	47.0%	Negligible
H18	634640	166153	1.6	25	0.05	11.65	0.2%	46.6%	Negligible
H19	634680	166079	1.6	25	0.04	11.18	0.2%	44.7%	Negligible
H20	634651	165954	1.6	25	0.04	11.06	0.2%	44.2%	Negligible
H21	634584	165938	1.6	25	0.05	11.00	0.2%	44.0%	Negligible
H22	634694	165880	1.6	25	0.04	10.99	0.2%	44.0%	Negligible
H23	634455	165807	1.6	25	0.07	11.02	0.3%	44.1%	Negligible
H24	635028	166030	1.6	25	0.03	12.14	0.1%	48.6%	Negligible
H25	635479	166321	1.6	25	0.01	11.53	0.1%	46.1%	Negligible
H26	635757	166282	1.6	25	0.01	11.52	0.0%	46.1%	Negligible
H27	636106	166044	1.6	25	0.01	10.85	0.0%	43.4%	Negligible
H28	636063	165787	1.6	25	0.01	11.38	0.0%	45.5%	Negligible
H29	635661	165661	1.6	25	0.01	11.61	0.0%	46.4%	Negligible
H30	635606	165627	1.6	25	0.01	11.61	0.0%	46.4%	Negligible
H31	635903	165323	1.6	25	0.01	11.61	0.0%	46.4%	Negligible
H32	635777	165134	1.6	25	0.01	12.37	0.0%	49.5%	Negligible
H33	634774	165056	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H34	634770	165249	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H35	634726	165251	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H36	634682	165251	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H37	634646	165253	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H38	634602	165260	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H39	634603	165217	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H40	634601	165182	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H41	634599	165138	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H42	634596	165101	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H43	634450	165100	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
H44	634382	165134	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H45	634518	164793	1.6	25	0.01	11.23	0.1%	44.9%	Negligible
H46	633418	164980	1.6	25	0.01	11.32	0.1%	45.3%	Negligible
H47	633287	164842	1.6	25	0.01	11.32	0.0%	45.3%	Negligible
H48	633076	164912	1.6	25	0.01	11.32	0.0%	45.3%	Negligible
H49	632465	165443	1.6	25	0.02	11.64	0.1%	46.6%	Negligible
H50	632426	165384	1.6	25	0.02	11.52	0.1%	46.1%	Negligible
H51	632378	165324	1.6	25	0.02	11.33	0.1%	45.3%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H52	632242	165162	1.6	25	0.01	11.33	0.1%	45.3%	Negligible
H53	632166	165091	1.6	25	0.01	11.33	0.1%	45.3%	Negligible
H54	632064	165515	1.6	25	0.04	11.76	0.1%	47.0%	Negligible
H55	632023	165273	1.6	25	0.02	11.33	0.1%	45.3%	Negligible
H56	631079	165231	1.6	25	0.01	11.59	0.0%	46.3%	Negligible
H57	630849	165341	1.6	25	0.01	11.31	0.0%	45.2%	Negligible
H58	631238	165328	1.6	25	0.01	11.59	0.0%	46.4%	Negligible
H59	631258	165433	1.6	25	0.01	11.59	0.0%	46.4%	Negligible
H60	631203	165516	1.6	25	0.01	11.74	0.0%	47.0%	Negligible
H61	631139	165561	1.6	25	0.01	11.78	0.0%	47.1%	Negligible
H62	631045	165700	1.6	25	0.01	12.13	0.0%	48.5%	Negligible
H63	631091	165778	1.6	25	0.01	11.59	0.0%	46.3%	Negligible
H64	631111	165805	1.6	25	0.03	12.11	0.1%	48.4%	Negligible
H65	631115	165852	1.6	25	0.02	12.20	0.1%	48.8%	Negligible
H66	631061	165470	1.6	25	0.01	11.59	0.0%	46.3%	Negligible
H67	634597	166287	1.6	25	0.04	11.05	0.2%	44.2%	Negligible
H68	635335	165657	1.6	25	0.01	11.62	0.1%	46.5%	Negligible
H69	634417	165213	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
H70	631268	165516	1.6	25	0.01	11.76	0.0%	47.0%	Negligible
A01	628199	169135	1.6	25	0.00	10.15	0.0%	40.6%	Negligible
A02	629810	168213	1.6	25	0.00	11.04	0.0%	44.2%	Negligible
A03	630337	168165	1.6	25	0.00	10.91	0.0%	43.6%	Negligible
A04	631554	168915	1.6	25	0.00	11.24	0.0%	44.9%	Negligible
A05	632410	169167	1.6	25	0.00	10.89	0.0%	43.5%	Negligible
A06	633542	169294	1.6	25	0.00	11.04	0.0%	44.2%	Negligible
A07	635052	169313	1.6	25	0.00	10.56	0.0%	42.2%	Negligible
A08	635998	168591	1.6	25	0.00	11.10	0.0%	44.4%	Negligible
A09	635909	167560	1.6	25	0.01	11.41	0.0%	45.6%	Negligible
A10	635754	166743	1.6	25	0.01	11.52	0.0%	46.1%	Negligible
A11	635574	165975	1.6	25	0.01	11.61	0.0%	46.5%	Negligible
A12	635125	165203	1.6	25	0.02	11.62	0.1%	46.5%	Negligible
A13	634752	165243	1.6	25	0.02	10.97	0.1%	43.9%	Negligible
A14	634369	165285	1.6	25	0.04	10.99	0.2%	44.0%	Negligible
A15	634356	165091	1.6	25	0.02	10.98	0.1%	43.9%	Negligible
A16	634362	164473	1.6	25	0.01	10.95	0.0%	43.8%	Negligible
A17	634276	164112	1.6	25	0.01	10.95	0.0%	43.8%	Negligible
A18	634556	163810	1.6	25	0.01	10.27	0.0%	41.1%	Negligible
A19	634834	164066	1.6	25	0.01	10.95	0.0%	43.8%	Negligible
A20	635064	163939	1.6	25	0.01	9.98	0.0%	39.9%	Negligible
A21	635416	164358	1.6	25	0.01	11.01	0.0%	44.0%	Negligible
A22	630226	169070	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A23	630235	169089	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A24	630253	169081	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A25	630270	169076	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A26	630288	169071	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A27	630308	169071	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A28	630308	169058	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A29	630290	169050	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A30	630276	169045	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A31	630254	169033	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
A32	637052	165324	1.6	25	0.00	10.87	0.0%	43.5%	Negligible

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A33	637046	165372	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A34	637074	165376	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A35	637065	165340	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A36	637075	165331	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A37	637104	165345	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A38	637140	165328	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A39	637119	165323	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A40	637099	165327	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A41	637082	165319	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A42	637085	165289	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
A43	637063	165280	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
M01	635931	165331	1.6	25	0.01	11.61	0.0%	46.4%	Negligible
M02	638483	165430	1.6	25	0.00	10.75	0.0%	43.0%	Negligible
M03	630284	169052	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
M04	639019	167981	1.6	25	0.00	10.62	0.0%	42.5%	Negligible
M05	635539	169840	1.6	25	0.00	10.56	0.0%	42.2%	Negligible
M06	630254	169037	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
M07	634445	164416	1.6	25	0.01	10.95	0.0%	43.8%	Negligible
M08	638492	165410	1.6	25	0.00	10.75	0.0%	43.0%	Negligible
M09	639097	165971	1.6	25	0.00	9.95	0.0%	39.8%	Negligible
M10	634662	166026	1.6	25	0.04	11.05	0.2%	44.2%	Negligible
M11	632984	166419	1.6	25	0.08	11.21	0.3%	44.8%	Negligible
M12	631161	165486	1.6	25	0.01	11.59	0.0%	46.4%	Negligible
M13	636570	167891	1.6	25	0.00	11.29	0.0%	45.2%	Negligible
M14	636405	168227	1.6	25	0.00	11.52	0.0%	46.1%	Negligible
M15	635932	165333	1.6	25	0.01	11.61	0.0%	46.4%	Negligible
M16	630438	169111	1.6	25	0.00	10.42	0.0%	41.7%	Negligible
M17	630186	168983	1.6	25	0.00	10.91	0.0%	43.6%	Negligible
M18	638616	165564	1.6	25	0.00	10.74	0.0%	43.0%	Negligible
M19	638472	165432	1.6	25	0.00	10.75	0.0%	43.0%	Negligible
M20	637135	165354	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
M21	636815	167297	1.6	25	0.00	11.29	0.0%	45.2%	Negligible
M22	638220	168614	1.6	25	0.00	10.76	0.0%	43.0%	Negligible
M23	637112	165331	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
M24	638536	165465	1.6	25	0.00	10.75	0.0%	43.0%	Negligible
M25	637092	165340	1.6	25	0.00	10.87	0.0%	43.5%	Negligible
M26	638528	165426	1.6	25	0.00	10.75	0.0%	43.0%	Negligible
M27	634752	170679	1.6	25	0.00	10.37	0.0%	41.5%	Negligible

Year 2. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	3	0.01	0.01	0.2%	0.2%	
H02	631165	166314	1.6	3	0.01	0.01	0.2%	0.2%	
H03	631186	166424	1.6	3	0.01	0.01	0.2%	0.2%	
H04	631003	166651	1.6	3	0.00	0.00	0.1%	0.1%	
H05	630864	166832	1.6	3	0.00	0.00	0.1%	0.1%	
H06	632086	166298	1.6	3	0.02	0.02	0.8%	0.8%	
H07	632159	166430	1.6	3	0.02	0.02	0.6%	0.6%	
H08	632489	166193	1.6	3	0.02	0.02	0.7%	0.7%	
H09	632629	166210	1.6	3	0.02	0.02	0.8%	0.8%	
H10	633019	166385	1.6	3	0.04	0.04	1.2%	1.2%	
H11	633039	166403	1.6	3	0.04	0.04	1.3%	1.3%	
H12	633126	166502	1.6	3	0.04	0.04	1.3%	1.3%	
H13	633285	166619	1.6	3	0.04	0.04	1.2%	1.2%	
H14	633912	166981	1.6	3	0.02	0.02	0.7%	0.7%	
H15	634183	166374	1.6	3	0.02	0.02	0.7%	0.7%	
H16	634509	166374	1.6	3	0.02	0.02	0.5%	0.5%	
H17	634621	166241	1.6	3	0.01	0.01	0.5%	0.5%	
H18	634640	166153	1.6	3	0.02	0.02	0.5%	0.5%	
H19	634680	166079	1.6	3	0.02	0.02	0.5%	0.5%	
H20	634651	165954	1.6	3	0.02	0.02	0.6%	0.6%	
H21	634584	165938	1.6	3	0.02	0.02	0.6%	0.6%	
H22	634694	165880	1.6	3	0.02	0.02	0.6%	0.6%	
H23	634455	165807	1.6	3	0.03	0.03	0.9%	0.9%	
H24	635028	166030	1.6	3	0.01	0.01	0.4%	0.4%	
H25	635479	166321	1.6	3	0.01	0.01	0.2%	0.2%	
H26	635757	166282	1.6	3	0.01	0.01	0.2%	0.2%	
H27	636106	166044	1.6	3	0.01	0.01	0.2%	0.2%	
H28	636063	165787	1.6	3	0.01	0.01	0.2%	0.2%	
H29	635661	165661	1.6	3	0.01	0.01	0.3%	0.3%	
H30	635606	165627	1.6	3	0.01	0.01	0.2%	0.2%	
H31	635903	165323	1.6	3	0.01	0.01	0.2%	0.2%	
H32	635777	165134	1.6	3	0.01	0.01	0.2%	0.2%	
H33	634774	165056	1.6	3	0.01	0.01	0.4%	0.4%	
H34	634770	165249	1.6	3	0.02	0.02	0.6%	0.6%	
H35	634726	165251	1.6	3	0.02	0.02	0.6%	0.6%	
H36	634682	165251	1.6	3	0.02	0.02	0.6%	0.6%	
H37	634646	165253	1.6	3	0.02	0.02	0.6%	0.6%	
H38	634602	165260	1.6	3	0.02	0.02	0.6%	0.6%	
H39	634603	165217	1.6	3	0.02	0.02	0.6%	0.6%	
H40	634601	165182	1.6	3	0.02	0.02	0.5%	0.5%	
H41	634599	165138	1.6	3	0.02	0.02	0.5%	0.5%	
H42	634596	165101	1.6	3	0.01	0.01	0.5%	0.5%	
H43	634450	165100	1.6	3	0.01	0.01	0.5%	0.5%	
H44	634382	165134	1.6	3	0.02	0.02	0.5%	0.5%	
H45	634518	164793	1.6	3	0.01	0.01	0.3%	0.3%	
H46	633418	164980	1.6	3	0.02	0.02	0.5%	0.5%	
H47	633287	164842	1.6	3	0.01	0.01	0.4%	0.4%	
H48	633076	164912	1.6	3	0.01	0.01	0.5%	0.5%	
H49	632465	165443	1.6	3	0.03	0.03	0.8%	0.8%	

Year 2. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
H50	632426	165384	1.6	3	0.02	0.02	0.7%	0.7%	
H51	632378	165324	1.6	3	0.02	0.02	0.7%	0.7%	
H52	632242	165162	1.6	3	0.02	0.02	0.6%	0.6%	
H53	632166	165091	1.6	3	0.02	0.02	0.5%	0.5%	
H54	632064	165515	1.6	3	0.02	0.02	0.7%	0.7%	
H55	632023	165273	1.6	3	0.02	0.02	0.5%	0.5%	
H56	631079	165231	1.6	3	0.01	0.01	0.3%	0.3%	
H57	630849	165341	1.6	3	0.01	0.01	0.2%	0.2%	
H58	631238	165328	1.6	3	0.01	0.01	0.3%	0.3%	
H59	631258	165433	1.6	3	0.01	0.01	0.3%	0.3%	
H60	631203	165516	1.6	3	0.01	0.01	0.3%	0.3%	
H61	631139	165561	1.6	3	0.01	0.01	0.3%	0.3%	
H62	631045	165700	1.6	3	0.01	0.01	0.2%	0.2%	
H63	631091	165778	1.6	3	0.01	0.01	0.3%	0.3%	
H64	631111	165805	1.6	3	0.01	0.01	0.3%	0.3%	
H65	631115	165852	1.6	3	0.01	0.01	0.3%	0.3%	
H66	631061	165470	1.6	3	0.01	0.01	0.2%	0.2%	
H67	634597	166287	1.6	3	0.02	0.02	0.5%	0.5%	
H68	635335	165657	1.6	3	0.01	0.01	0.3%	0.3%	
H69	634417	165213	1.6	3	0.02	0.02	0.6%	0.6%	
H70	631268	165516	1.6	3	0.01	0.01	0.3%	0.3%	
S01	633172	166482	1.6	3	0.04	0.04	1.4%	1.4%	
S02	633258	166471	1.6	3	0.04	0.04	1.5%	1.5%	
S03	633351	166555	1.6	3	0.04	0.04	1.5%	1.5%	
S04	634633	165956	1.6	3	0.02	0.02	0.6%	0.6%	
S05	635743	166131	1.6	3	0.01	0.01	0.2%	0.2%	
S06	636110	165647	1.6	3	0.01	0.01	0.2%	0.2%	
S07	631121	165603	1.6	3	0.01	0.01	0.3%	0.3%	
S08	631189	165670	1.6	3	0.01	0.01	0.3%	0.3%	
A01	628199	169135	1.6	3	0.00	0.00	0.0%	0.0%	
A02	629810	168213	1.6	3	0.00	0.00	0.1%	0.1%	
A03	630337	168165	1.6	3	0.00	0.00	0.1%	0.1%	
A04	631554	168915	1.6	3	0.00	0.00	0.1%	0.1%	
A05	632410	169167	1.6	3	0.01	0.01	0.2%	0.2%	
A06	633542	169294	1.6	3	0.01	0.01	0.2%	0.2%	
A07	635052	169313	1.6	3	0.00	0.00	0.2%	0.2%	
A08	635998	168591	1.6	3	0.00	0.00	0.1%	0.1%	
A09	635909	167560	1.6	3	0.00	0.00	0.1%	0.1%	
A10	635754	166743	1.6	3	0.00	0.00	0.2%	0.2%	
A11	635574	165975	1.6	3	0.01	0.01	0.2%	0.2%	
A12	635125	165203	1.6	3	0.01	0.01	0.4%	0.4%	
A13	634752	165243	1.6	3	0.02	0.02	0.6%	0.6%	
A14	634369	165285	1.6	3	0.02	0.02	0.7%	0.7%	
A15	634356	165091	1.6	3	0.02	0.02	0.5%	0.5%	
A16	634362	164473	1.6	3	0.01	0.01	0.2%	0.2%	
A17	634276	164112	1.6	3	0.01	0.01	0.2%	0.2%	
A18	634556	163810	1.6	3	0.00	0.00	0.1%	0.1%	
A19	634834	164066	1.6	3	0.00	0.00	0.1%	0.1%	
A20	635064	163939	1.6	3	0.00	0.00	0.1%	0.1%	

Year 2. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A21	635416	164358	1.6	3	0.01	0.01	0.2%	0.2%	
A22	630226	169070	1.6	3	0.00	0.00	0.1%	0.1%	
A23	630235	169089	1.6	3	0.00	0.00	0.1%	0.1%	
A24	630253	169081	1.6	3	0.00	0.00	0.1%	0.1%	
A25	630270	169076	1.6	3	0.00	0.00	0.1%	0.1%	
A26	630288	169071	1.6	3	0.00	0.00	0.1%	0.1%	
A27	630308	169071	1.6	3	0.00	0.00	0.1%	0.1%	
A28	630308	169058	1.6	3	0.00	0.00	0.1%	0.1%	
A29	630290	169050	1.6	3	0.00	0.00	0.1%	0.1%	
A30	630276	169045	1.6	3	0.00	0.00	0.1%	0.1%	
A31	630254	169033	1.6	3	0.00	0.00	0.1%	0.1%	
A32	637052	165324	1.6	3	0.00	0.00	0.1%	0.1%	
A33	637046	165372	1.6	3	0.00	0.00	0.1%	0.1%	
A34	637074	165376	1.6	3	0.00	0.00	0.1%	0.1%	
A35	637065	165340	1.6	3	0.00	0.00	0.1%	0.1%	
A36	637075	165331	1.6	3	0.00	0.00	0.1%	0.1%	
A37	637104	165345	1.6	3	0.00	0.00	0.1%	0.1%	
A38	637140	165328	1.6	3	0.00	0.00	0.1%	0.1%	
A39	637119	165323	1.6	3	0.00	0.00	0.1%	0.1%	
A40	637099	165327	1.6	3	0.00	0.00	0.1%	0.1%	
A41	637082	165319	1.6	3	0.00	0.00	0.1%	0.1%	
A42	637085	165289	1.6	3	0.00	0.00	0.1%	0.1%	
A43	637063	165280	1.6	3	0.00	0.00	0.1%	0.1%	
M01	635931	165331	1.6	3	0.01	0.01	0.2%	0.2%	
M02	638483	165430	1.6	3	0.00	0.00	0.1%	0.1%	
M03	630284	169052	1.6	3	0.00	0.00	0.1%	0.1%	
M04	639019	167981	1.6	3	0.00	0.00	0.1%	0.1%	
M05	635539	169840	1.6	3	0.00	0.00	0.1%	0.1%	
M06	630254	169037	1.6	3	0.00	0.00	0.1%	0.1%	
M07	634445	164416	1.6	3	0.01	0.01	0.2%	0.2%	
M08	638492	165410	1.6	3	0.00	0.00	0.1%	0.1%	
M09	639097	165971	1.6	3	0.00	0.00	0.1%	0.1%	
M10	634662	166026	1.6	3	0.02	0.02	0.5%	0.5%	
M11	632984	166419	1.6	3	0.03	0.03	1.1%	1.1%	
M12	631161	165486	1.6	3	0.01	0.01	0.3%	0.3%	
M13	636570	167891	1.6	3	0.00	0.00	0.1%	0.1%	
M14	636405	168227	1.6	3	0.00	0.00	0.1%	0.1%	
M15	635932	165333	1.6	3	0.01	0.01	0.2%	0.2%	
M16	630438	169111	1.6	3	0.00	0.00	0.1%	0.1%	
M17	630186	168983	1.6	3	0.00	0.00	0.1%	0.1%	
M18	638616	165564	1.6	3	0.00	0.00	0.1%	0.1%	
M19	638472	165432	1.6	3	0.00	0.00	0.1%	0.1%	
M20	637135	165354	1.6	3	0.00	0.00	0.1%	0.1%	
M21	636815	167297	1.6	3	0.00	0.00	0.1%	0.1%	
M22	638220	168614	1.6	3	0.00	0.00	0.1%	0.1%	
M23	637112	165331	1.6	3	0.00	0.00	0.1%	0.1%	
M24	638536	165465	1.6	3	0.00	0.00	0.1%	0.1%	
M25	637092	165340	1.6	3	0.00	0.00	0.1%	0.1%	
M26	638528	165426	1.6	3	0.00	0.00	0.1%	0.1%	

Year 2. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	3	0.00	0.00	0.1%	0.1%	

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical l	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E01	621048	168683	0	8	0.00	12.60	0.0%	157.5%	Not significant
E02	625191	169137	0	8	0.00	12.74	0.0%	159.3%	Not significant
E03	628533	169560	0	8	0.01	12.75	0.1%	159.4%	Not significant
E04	629867	169917	0	8	0.01	12.75	0.1%	159.4%	Not significant
E05	630740	169804	0	8	0.01	13.03	0.2%	162.9%	Not significant
E06	631813	170059	0	8	0.02	10.38	0.2%	129.7%	Not significant
E07	632683	170381	0	8	0.02	10.38	0.2%	129.7%	Not significant
E08	633993	170521	0	8	0.02	10.38	0.2%	129.7%	Not significant
E09	635116	170740	0	8	0.01	10.79	0.2%	134.9%	Not significant
E10	636457	171381	0	8	0.01	10.79	0.1%	134.9%	Not significant
E11	637964	171321	0	8	0.01	10.79	0.1%	134.9%	Not significant
E12	639028	171113	0	8	0.01	10.79	0.1%	134.9%	Not significant
E13	639841	170161	0	8	0.01	10.79	0.1%	134.9%	Not significant
E14	639882	168631	0	8	0.01	13.17	0.1%	164.6%	Not significant
E15	639810	167452	0	8	0.01	13.17	0.1%	164.6%	Not significant
E16	639527	166684	0	8	0.01	13.17	0.2%	164.7%	Not significant
E17	639241	165688	0	8	0.02	13.18	0.2%	164.7%	Not significant
E18	638891	165003	0	Not sensitive	0.02	13.18	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	0.02	10.80	N/A	N/A	Not significant
E20	637303	164087	0	8	0.02	10.80	0.3%	135.0%	Not significant
E21	636318	164194	0	8	0.04	10.82	0.5%	135.2%	Not significant
E22	635298	164386	0	8	0.06	10.84	0.7%	135.4%	Not significant
E23	634800	164047	0	8	0.04	13.48	0.5%	168.5%	Not significant
E24	634346	163650	0	8	0.03	13.47	0.3%	168.3%	Not significant
E25	633796	162733	0	8	0.02	13.46	0.2%	168.2%	Not significant
E26	633703	162425	0	8	0.02	13.46	0.2%	168.2%	Not significant
E27	634513	161455	0	8	0.01	13.45	0.1%	168.1%	Not significant
E28	633502	161188	0	8	0.01	13.45	0.1%	168.1%	Not significant
E29	635337	160698	0	8	0.01	10.79	0.1%	134.8%	Not significant
E30	633692	159746	0	8	0.01	15.69	0.1%	196.1%	Not significant
E31	634794	159415	0	8	0.01	15.69	0.1%	196.1%	Not significant
E32	635708	159117	0	8	0.00	12.04	0.1%	150.6%	Not significant
E33	633607	158133	0	8	0.01	15.69	0.1%	196.1%	Not significant
E34	635539	157577	0	8	0.00	12.04	0.0%	150.5%	Not significant
E35	633584	156906	0	Not assessed	0.00	15.68	N/A	N/A	Not significant
E36	635214	156105	0	8	0.00	12.04	0.0%	150.5%	Not significant
E37	632347	155607	0	Not assessed	0.00	15.68	N/A	N/A	Not significant
E38	632033	163044	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E39	632554	162933	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E40	633412	162328	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E41	633527	162189	0	Not assessed	0.01	13.45	N/A	N/A	Not significant
E42	632364	162425	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E43	622112	162206	0	5	0.00	14.28	0.1%	285.7%	Not significant
E44	623126	162989	0	5	0.00	14.28	0.1%	285.7%	Not significant
E45	624052	162872	0	No critical load	0.00	14.28	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	0.00	14.28	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	0.00	14.28	N/A	N/A	Not significant
E48	623648	161865	0	5	0.00	14.28	0.1%	285.7%	Not significant
E49	622879	161358	0	5	0.00	14.28	0.1%	285.7%	Not significant
E50	631694	164088	0	20	0.04	12.64	0.2%	63.2%	Not significant
E51	631458	164099	0	20	0.04	12.78	0.2%	63.9%	Not significant
E52	631039	164107	0	20	0.04	12.78	0.2%	63.9%	Not significant
E53	632436	162421	0	20	0.02	12.76	0.1%	63.8%	Not significant
E54	631908	162848	0	20	0.02	13.04	0.1%	65.2%	Not significant
E55	631008	162944	0	20	0.02	10.38	0.1%	51.9%	Not significant
E56	630479	164211	0	10	0.06	17.70	0.6%	177.0%	Not significant
E57	630389	164405	0	10	0.06	17.70	0.6%	177.0%	Not significant

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical l	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E58	630172	164540	0	10	0.05	18.67	0.5%	186.7%	Not significant
E59	633116	169430	0	10	0.05	18.67	0.5%	186.7%	Not significant
E60	633976	168913	0	10	0.08	18.70	0.8%	187.0%	Not significant
E61	635881	166552	0	10	0.12	18.74	1.2%	187.4%	Not significant
E62	635634	165614	0	10	0.15	18.77	1.5%	187.7%	Not significant
E63	635696	165271	0	10	0.12	22.80	1.2%	228.0%	Not significant
E64	635212	165108	0	10	0.17	22.85	1.7%	228.5%	Not significant
E65	635302	164394	0	10	0.11	22.79	1.1%	227.9%	Not significant
E66	634825	164063	0	10	0.08	22.76	0.8%	227.6%	Not significant
E67	634369	163647	0	20	0.03	13.19	0.1%	65.9%	Not significant
E68	634218	163399	0	20	0.02	10.80	0.1%	54.0%	Not significant
E69	633122	163264	0	10	0.05	18.53	0.5%	185.3%	Not significant
E70	633581	165056	0	10	0.24	18.72	2.4%	187.2%	Not significant
E71	633420	165112	0	10	0.27	18.75	2.7%	187.5%	Not significant
E72	633441	164876	0	10	0.19	23.15	1.9%	231.5%	Not significant
E73	633330	164922	0	10	0.20	23.16	2.0%	231.6%	Not significant
E74	632062	164071	0	10	0.07	23.03	0.7%	230.3%	Not significant
E75	631267	164655	0	10	0.10	23.06	1.0%	230.6%	Not significant
E76	631135	164551	0	10	0.09	23.05	0.9%	230.5%	Not significant
E77	631149	166159	0	10	0.08	23.04	0.8%	230.4%	Not significant
E78	632034	166274	0	10	0.27	18.75	2.7%	187.5%	Not significant
E79	632106	166329	0	10	0.28	26.18	2.8%	261.8%	Not significant
E80	632102	166377	0	10	0.26	26.16	2.6%	261.6%	Not significant
E81	633049	166413	0	10	1.79	21.11	17.9%	211.1%	Not significant
E82	633119	166478	0	10	1.76	27.66	17.6%	276.6%	Not significant
E83	632891	166706	0	10	0.48	19.80	4.8%	198.0%	Not significant
E84	632763	166769	0	10	0.37	26.27	3.7%	262.7%	Not significant
E85	631105	168000	0	10	0.06	19.38	0.6%	193.8%	Not significant
E86	631260	168095	0	10	0.06	25.96	0.6%	259.6%	Not significant
E87	631603	168434	0	10	0.06	23.02	0.6%	230.2%	Not significant
E88	632016	168303	0	10	0.07	23.03	0.7%	230.3%	Not significant

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean acidity deposition rates.

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

				Acid Deposition (keq ha-1 y-1)									Exceedance			% of CL function			
Receptor n	X(m)	Y(m)	Z(m)	CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC	PC	Background	PEC	PC	Backgroun	PEC	Impact
E01	621048	168683	0	0.88	0.223	1.13	0	0.0002	0.20	0.90	0.2	0.900162	No exceedance	No exceedance	No exceedance	0.0	97.3	97.4	Not significant
E02	625191	169137	0	0.88	0.223	1.13	0	0.0003	0.19	0.91	0.19	0.910266	No exceedance	No exceedance	No exceedance	0.0	97.3	97.4	Not significant
E03	628533	169560	0	0.88	0.223	1.13	0	0.0007	0.19	0.91	0.19	0.910684	No exceedance	No exceedance	No exceedance	0.1	97.3	97.4	Not significant
E04	629867	169917	0	0.88	0.223	1.13	0	0.0008	0.19	0.91	0.19	0.910803	No exceedance	No exceedance	No exceedance	0.1	97.3	97.4	Not significant
E05	630740	169804	0	0.88	0.223	1.13	0	0.0010	0.20	0.93	0.2	0.930968	No exceedance	No exceedance	0.00	0.1	100.0	100.1	Not significant
E06	631813	170059	0	0.88	0.223	1.13	0	0.0011	0.19	0.74	0.19	0.741137	No exceedance	No exceedance	No exceedance	0.1	82.3	82.4	Not significant
E07	632683	170381	0	0.88	0.223	1.13	0	0.0011	0.19	0.74	0.19	0.741098	No exceedance	No exceedance	No exceedance	0.1	82.3	82.4	Not significant
E08	633993	170521	0	0.88	0.223	1.13	0	0.0014	0.19	0.74	0.19	0.741411	No exceedance	No exceedance	No exceedance	0.1	82.3	82.4	Not significant
E09	635116	170740	0	0.88	0.223	1.13	0	0.0010	0.20	0.77	0.2	0.771035	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E10	636457	171381	0	0.88	0.223	1.13	0	0.0008	0.20	0.77	0.2	0.770773	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E11	637964	171321	0	0.88	0.223	1.13	0	0.0006	0.20	0.77	0.2	0.770628	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E12	639028	171113	0	0.88	0.223	1.13	0	0.0006	0.20	0.77	0.2	0.770648	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E13	639841	170161	0	0.88	0.223	1.13	0	0.0006	0.20	0.77	0.2	0.77062	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E14	639882	168631	0	0.88	0.223	1.13	0	0.0006	0.23	0.94	0.23	0.940638	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E15	639810	167452	0	0.88	0.223	1.13	0	0.0008	0.23	0.94	0.23	0.940784	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E16	639527	166684	0	0.88	0.223	1.13	0	0.0009	0.23	0.94	0.23	0.94093	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E17	639241	165688	0	0.88	0.223	1.13	0	0.0011	0.23	0.94	0.23	0.941074	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E18	638891	165003	0	Not sensitive	Not sensitive	Not sensitive	0	0.0012	0.23	0.94	0.23	0.941154	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	Not sensitive	Not sensitive	0	0.0011	0.21	0.77	0.21	0.771078	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E20	637303	164087	0	0.90	0.223	1.123	0	0.0016	0.21	0.77	0.21	0.771644	No exceedance	No exceedance	No exceedance	0.1	87.3	87.4	Not significant
E21	636318	164194	0	0.90	0.223	1.123	0	0.0027	0.21	0.77	0.21	0.772718	No exceedance	No exceedance	No exceedance	0.2	87.3	87.5	Not significant
E22	635298	164386	0	0.90	0.223	1.123	0	0.0039	0.21	0.77	0.21	0.77393	No exceedance	No exceedance	No exceedance	0.3	87.3	87.6	Not significant
E23	634800	164047	0	0.90	0.223	1.123	0	0.0028	0.20	0.96	0.2	0.962779	No exceedance	0.04	0.04	0.2	103.3	103.5	Not significant
E24	634346	163650	0	0.90	0.223	1.123	0	0.0018	0.20	0.96	0.2	0.961788	No exceedance	0.04	0.04	0.2	103.3	103.5	Not significant
E25	633796	162733	0	0.88	0.223	1.13	0	0.0013	0.20	0.96	0.2	0.961279	No exceedance	0.03	0.03	0.1	102.7	102.8	Not significant
E26	633703	162425	0	0.88	0.223	1.13	0	0.0011	0.20	0.96	0.2	0.961135	No exceedance	0.03	0.03	0.1	102.7	102.8	Not significant
E27	634513	161455	0	0.90	0.223	1.123	0	0.0007	0.20	0.96	0.2	0.960685	No exceedance	0.04	0.04	0.1	103.3	103.4	Not significant
E28	633502	161188	0	0.90	0.223	1.123	0	0.0007	0.20	0.96	0.2	0.960731	No exceedance	0.04	0.04	0.1	103.3	103.4	Not significant
E29	635337	160698	0	0.90	0.223	1.123	0	0.0005	0.21	0.77	0.21	0.770478	No exceedance	No exceedance	No exceedance	0.0	87.3	87.3	Not significant
E30	633692	159746	0	0.90	0.223	1.123	0	0.0005	0.25	1.12	0.25	1.120499	No exceedance	0.25	0.25	0.0	122.0	122.0	Not significant
E31	634794	159415	0	0.90	0.223	1.123	0	0.0004	0.25	1.12	0.25	1.120398	No exceedance	0.25	0.25	0.0	122.0	122.0	Not significant
E32	635708	159117	0	0.90	0.223	1.123	0	0.0003	0.23	0.86	0.23	0.86031	No exceedance	No exceedance	No exceedance	0.0	97.1	97.1	Not significant
E33	633607	158133	0	0.90	0.223	1.123	0	0.0004	0.25	1.12	0.25	1.120362	No exceedance	0.25	0.25	0.0	122.0	122.0	Not significant
E34	635539	157577	0	0.90	0.223	1.123	0	0.0003	0.23	0.86	0.23	0.860252	No exceedance	No exceedance	No exceedance	0.0	97.1	97.1	Not significant
E35	633584	156906	0	0.32	0.248	0.526	0	0.0003	0.25	1.12	0.25	1.120295	No exceedance	0.84	0.84	0.1	260.5	260.5	Not significant
E36	635214	156105	0	0.88	0.223	1.13	0	0.0002	0.23	0.86	0.23	0.860229	No exceedance	No exceedance	No exceedance	0.0	96.5	96.5	Not significant
E37	632347	155607	0	0.32	0.248	0.526	0	0.0002	0.25	1.12	0.25	1.120224	No exceedance	0.84	0.84	0.0	260.5	260.5	Not significant
E38	632033	163044	0	0.32	0.248	0.526	0	0.0014	0.20	0.96	0.2	0.961401	No exceedance	0.63	0.64	0.3	220.5	220.8	Not significant
E39	632554	162933	0	0.32	0.248	0.526	0	0.0014	0.20	0.96	0.2	0.961445	No exceedance	0.63	0.64	0.3	220.5	220.8	Not significant
E40	633412	162328	0	0.32	0.248	0.526	0	0.0011	0.20	0.96	0.2	0.961097	No exceedance	0.63	0.64	0.2	220.5	220.7	Not significant
E41	633527	162189	0	0.32	0.248	0.526	0	0.0010	0.20	0.96	0.2	0.961038	No exceedance	0.63	0.64	0.2	220.5	220.7	Not significant
E42	632364	162425	0	0.32	0.248	0.526	0	0.0011	0.20	0.96	0.2	0.961149	No exceedance	0.63	0.64	0.2	220.5	220.8	Not significant
E43	622112	162206	0	0.23	0.321	0.542	0	0.0002	0.22	1.02	0.22	1.020239	No exceedance	0.70	0.70	0.0	228.8	228.8	Not significant
E44	623126	162989	0	0.23	0.321	0.542	0	0.0003	0.22	1.02	0.22	1.020264	No exceedance	0.70	0.70	0.0	228.8	228.8	Not significant
E45	624052	162872	0	No critical load	No critical load	No critical load	0	0.0003	0.22	1.02	0.22	1.020318	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	No critical load	No critical load	0	0.0003	0.22	1.02	0.22	1.020326	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	No critical load	No critical load	0	0.0003	0.22	1.02	0.22	1.020321	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E48	623648	161865	0	0.23	0.321	0.542	0	0.0003	0.22	1.02	0.22	1.020306	No exceedance	0.70	0.70	0.1	228.8	228.8	Not significant
E49	622879	161358	0	0.23	0.321	0.542	0	0.0003	0.22	1.02	0.22	1.020273	No exceedance	0.70	0.70	0.1	228.8	228.8	Not significant
E50	631694	164088	0	3.93	0.85	4.79	0	0.0028	0.20	0.90	0.2	0.902774	No exceedance	No exceedance	No exceedance	0.1	23.0	23.0	Not significant
E51	631458	164099	0	3.93	0.85	4.79	0	0.0029	0.19	0.91	0.19	0.912868	No exceedance	No exceedance	No exceedance	0.1	23.0	23.0	Not significant
E52	631039	164107	0	3.93	0.85	4.79	0	0.0027	0.19	0.91	0.19	0.912713	No exceedance	No exceedance	No exceedance	0.1	23.0	23.0	Not significant
E53	632436	162421	0	3.93	0.85	4.79	0	0.0011	0.19	0.91	0.19	0.911149	No exceedance	No exceedance	No exceedance	0.0	23.0	23.0	Not significant
E54	631908	162848	0	3.93	0.85	4.79	0	0.0013	0.20	0.93	0.2	0.931269	No exceedance	No exceedance	No exceedance	0.0	23.6	23.6	Not significant
E55	631008	162944	0	3.93	0.85	4.79	0	0.0013	0.19	0.74	0.19	0.741328	No exceedance	No exceedance	No exceedance	0.0	4.8	4.8	Not significant
E56	630479	164211	0	1.77	0.14	1.91	0	0.0044	0.23	1.26	0.23	1.264353	No exceedance	No exceedance	No exceedance	0.2	78.0	78.2	Not significant
E57	630389	164405	0	1.77	0.14	1.91	0	0.0040	0.23	1.26	0.23	1.264034	No exceedance	No exceedance	No exceedance	0.2	78.0	78.2	Not significant
E58	630172	164540	0	1.77	0.14	1.91	0	0.0034	0.24	1.33	0.24	1.333359	No exceedance	No exceedance	No exceedance	0.2	82.2	82.4	Not significant
E59	633116	169430	0	1.67	0.14	1.81	0	0.0037	0.24	1.33	0.24	1.333674	No exceedance	No exceedance	No exceedance	0.2	86.7	86.9	Not significant
E60	633976	168913	0	10.81	0.14	10.96	0	0.0055	0.24	1.33	0.24	1.335546	No exceedance	No exceedance	No exceedance	0.1	14.3	14.4	Not significant
E61	635881	166552	0	1.68	0.14	1.82	0	0.0086	0.24	1.33	0.24	1.338613	No exceedance	No exceedance	No exceedance	0.5	86.3	86.7	Not significant
E62	635634	165614	0	10.83	0.14	10.97	0	0.0105	0.24	1.33	0.24	1.340464	No exceedance	No exceedance	No exceedance	0.1	14.3	14.4	Not significant
E63	635696	165271	0	10.83	0.14	10.97	0	0.0086	0.28	1.62	0.28	1.628557	No exceedance	No exceedance	No exceedance	0.1	17.3	17.4	Not significant
E64	635212	165108	0	10.83	0.14	10.97	0	0.0125	0.28	1.62	0.28	1.632498	No exceedance	No exceedance	No exceedance	0.1	17.3	17.4	Not significant
E65	635302	164394	0	1.72	0.14	1.86	0	0.0079	0.28	1.62	0.28	1.627911	No exceedance	0.04	0.05	0.4	102.2	102.6	Not significant
E66	634825	164063	0	1.77	0.14	1.91	0	0.0056	0.28	1.62	0.28	1.625642	No exceedance	No exceedance	No exceedance	0.3	99.5	99.8	Not significant
E67	634369	163647	0	3.93	0.85	4.79	0	0.0018	0.23	0.94	0.23	0.941793	No exceedance	No exceedance	No exceedance	0.0	24.4	24.5	Not significant
E68	634218	163399	0	3.93	0.85	4.79	0	0.0016	0.21	0.77	0.21	0.771591	No exceedance	No exceedance	No exceedance	0.0	5.3	5.3	Not significant
E69	633122	163264	0	1.77	0.14	1.92	0	0.0034	0.26	1.32	0.26	1.323377	No exceedance	No exceedance	No exceedance	0.2	82.3	82.5	Not significant
E70	633581	165056	0	10.83	0.14	10.97	0	0.0175	0.26	1.32	0.26	1.33748	No exceedance	No exceedance	No exceedance	0.2	14.4	14.6	Not significant
E71	633420	165112	0	10.83	0.14	10.97	0	0.0194	0.26	1.32	0.26	1.339386	No exceedance	No exceedance	No exceedance	0.2	14.4	14.6	Not significant
E72	633441	164876	0	1.77	0.14	1.92	0	0.0134	0.24	1.64	0.24	1.653436	No exceedance	No exceedance	No exceedance	0.7	97.9	98.6	Not significant
E73	633330	164922	0	1.77	0.14	1.92	0	0.0144	0.24	1.64	0.24	1.654411	No exceedance	No exceedance	No exceedance	0.8	97.9	98.7	Not significant
E74	632062	164071	0	1.77	0.14	1.92	0	0.0048	0.24	1.64	0.24	1.644797	No exceedance	No exceedance	No exceedance	0.2	97.9	98.2	Not significant

Year 2. Concentrations from airport operation, construction (Stage IIIB plant) and road traffic.
Annual mean acidity deposition rates.

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

				Acid Deposition (keq ha-1 y-1)								
Receptor n	X(m)	Y(m)	Z(m)	CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC
E75	631267	164655	0	1.77	0.14	1.91	0	0.0071	0.24	1.64	0.24	1.647075
E76	631135	164551	0	1.77	0.14	1.91	0	0.0064	0.24	1.64	0.24	1.646434
E77	631149	166159	0	1.68	0.14	1.82	0	0.0054	0.24	1.64	0.24	1.64536
E78	632034	166274	0	10.82	0.14	10.97	0	0.0196	0.26	1.32	0.26	1.339629
E79	632106	166329	0	10.82	0.14	10.97	0	0.0199	0.29	1.85	0.29	1.869851
E80	632102	166377	0	10.82	0.14	10.97	0	0.0183	0.29	1.85	0.29	1.868299
E81	633049	166413	0	10.82	0.14	10.97	0	0.1281	0.27	1.38	0.27	1.508104
E82	633119	166478	0	10.82	0.14	10.97	0	0.1259	0.29	1.85	0.29	1.975944
E83	632891	166706	0	10.82	0.14	10.97	0	0.0344	0.27	1.38	0.27	1.414403
E84	632763	166769	0	10.82	0.14	10.97	0	0.0266	0.29	1.85	0.29	1.876573
E85	631105	168000	0	1.67	0.14	1.81	0	0.0042	0.27	1.38	0.27	1.384158
E86	631260	168095	0	1.67	0.14	1.81	0	0.0043	0.29	1.85	0.29	1.854257
E87	631603	168434	0	1.67	0.14	1.81	0	0.0040	0.24	1.64	0.24	1.643997
E88	632016	168303	0	1.67	0.14	1.81	0	0.0049	0.24	1.64	0.24	1.644887

	Exceedance			% of CL function			
Receptor n	PC	Background	PEC	PC	Backgroun	PEC	Impact
E75	No exceedance	No exceedance	No exceedance	0.4	98.4	98.8	Not significant
E76	No exceedance	No exceedance	No exceedance	0.3	98.4	98.8	Not significant
E77	No exceedance	0.06	0.07	0.3	103.3	103.6	Not significant
E78	No exceedance	No exceedance	No exceedance	0.2	14.4	14.6	Not significant
E79	No exceedance	No exceedance	No exceedance	0.2	19.5	19.7	Not significant
E80	No exceedance	No exceedance	No exceedance	0.2	19.5	19.7	Not significant
E81	No exceedance	No exceedance	No exceedance	1.2	15.0	16.2	Not significant
E82	No exceedance	No exceedance	No exceedance	1.1	19.5	20.7	Not significant
E83	No exceedance	No exceedance	No exceedance	0.3	15.0	15.4	Not significant
E84	No exceedance	No exceedance	No exceedance	0.2	19.5	19.7	Not significant
E85	No exceedance	No exceedance	No exceedance	0.2	91.2	91.4	Not significant
E86	No exceedance	0.33	0.33	0.2	118.2	118.5	Not significant
E87	No exceedance	0.07	0.07	0.2	103.9	104.1	Not significant
E88	No exceedance	0.07	0.07	0.3	103.9	104.1	Not significant

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m·	% PC of AC	% PEC of A	Impact
E01	621048	168683	0	30	0.18	29.69	0.6%	99.0%	Not significant
E02	625191	169137	0	30	0.05	25.95	0.2%	86.5%	Not significant
E03	628533	169560	0	30	0.11	26.01	0.4%	86.7%	Not significant
E04	629867	169917	0	30	0.17	26.07	0.6%	86.9%	Not significant
E05	630740	169804	0	30	0.23	26.13	0.8%	87.1%	Not significant
E06	631813	170059	0	30	0.30	26.20	1.0%	87.3%	Not significant
E07	632683	170381	0	30	0.27	26.17	0.9%	87.2%	Not significant
E08	633993	170521	0	30	1.32	39.83	4.4%	132.8%	Further assessment required
E09	635116	170740	0	30	1.76	45.12	5.9%	150.4%	Further assessment required
E10	636457	171381	0	30	0.56	38.82	1.9%	129.4%	Further assessment required
E11	637964	171321	0	30	0.64	36.03	2.1%	120.1%	Further assessment required
E12	639028	171113	0	30	0.34	31.39	1.1%	104.6%	Further assessment required
E13	639841	170161	0	30	0.20	28.25	0.7%	94.2%	Not significant
E14	639882	168631	0	30	0.25	30.93	0.8%	103.1%	Not significant
E15	639810	167452	0	30	0.47	31.25	1.6%	104.2%	Further assessment required
E16	639527	166684	0	30	0.17	30.70	0.6%	102.3%	Not significant
E17	639241	165688	0	30	1.03	42.04	3.4%	140.1%	Further assessment required
E18	638891	165003	0	30	0.58	39.72	1.9%	132.4%	Further assessment required
E19	638595	164294	0	30	0.36	29.26	1.2%	97.5%	Further assessment required
E20	637303	164087	0	30	0.32	27.69	1.1%	92.3%	Further assessment required
E21	636318	164194	0	30	0.47	26.37	1.6%	87.9%	Further assessment required
E22	635298	164386	0	30	0.72	26.62	2.4%	88.7%	Further assessment required
E23	634800	164047	0	30	0.60	26.50	2.0%	88.3%	Further assessment required
E24	634346	163650	0	30	0.84	39.98	2.8%	133.3%	Further assessment required
E25	633796	162733	0	30	0.26	26.16	0.9%	87.2%	Not significant
E26	633703	162425	0	30	0.23	26.13	0.8%	87.1%	Not significant
E27	634513	161455	0	30	0.18	26.08	0.6%	86.9%	Not significant
E28	633502	161188	0	30	0.25	36.65	0.8%	122.2%	Not significant
E29	635337	160698	0	30	0.14	26.04	0.5%	86.8%	Not significant
E30	633692	159746	0	30	0.11	26.01	0.4%	86.7%	Not significant
E31	634794	159415	0	30	0.11	26.01	0.4%	86.7%	Not significant
E32	635708	159117	0	30	0.16	40.76	0.5%	135.9%	Not significant
E33	633607	158133	0	30	0.08	25.98	0.3%	86.6%	Not significant
E34	635539	157577	0	30	0.08	25.98	0.3%	86.6%	Not significant
E35	633584	156906	0	30	0.07	25.97	0.2%	86.6%	Not significant
E36	635214	156105	0	30	0.06	25.96	0.2%	86.5%	Not significant
E37	632347	155607	0	30	0.05	25.95	0.2%	86.5%	Not significant
E38	632033	163044	0	30	0.32	26.22	1.1%	87.4%	Further assessment required
E39	632554	162933	0	30	0.28	26.18	0.9%	87.3%	Not significant
E40	633412	162328	0	30	0.22	26.12	0.7%	87.1%	Not significant
E41	633527	162189	0	30	0.21	26.11	0.7%	87.0%	Not significant
E42	632364	162425	0	30	0.23	26.13	0.8%	87.1%	Not significant
E43	622112	162206	0	30	0.07	25.97	0.2%	86.6%	Not significant
E44	623126	162989	0	30	0.08	25.98	0.3%	86.6%	Not significant
E45	624052	162872	0	30	0.12	31.23	0.4%	104.1%	Not significant
E46	624096	162621	0	30	0.09	25.99	0.3%	86.6%	Not significant
E47	623938	162268	0	30	0.09	25.99	0.3%	86.6%	Not significant
E48	623648	161865	0	30	0.09	25.99	0.3%	86.6%	Not significant
E49	622879	161358	0	30	0.09	33.32	0.3%	111.1%	Not significant
E50	631694	164088	0	30	0.62	30.88	2.1%	102.9%	Not significant
E51	631458	164099	0	30	0.64	26.54	2.1%	88.5%	Not significant
E52	631039	164107	0	30	0.61	26.51	2.0%	88.4%	Not significant
E53	632436	162421	0	30	0.23	26.13	0.8%	87.1%	Not significant
E54	631908	162848	0	30	0.32	35.88	1.1%	119.6%	Not significant
E55	631008	162944	0	30	0.35	26.25	1.2%	87.5%	Not significant
E56	630479	164211	0	30	0.50	26.40	1.7%	88.0%	Not significant
E57	630389	164405	0	30	0.50	26.40	1.7%	88.0%	Not significant
E58	630172	164540	0	30	0.46	26.36	1.5%	87.9%	Not significant
E59	633116	169430	0	30	0.38	26.28	1.3%	87.6%	Not significant
E60	633976	168913	0	30	0.50	30.01	1.7%	100.0%	Not significant
E61	635881	166552	0	30	0.63	30.98	2.1%	103.3%	Not significant

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m-	% PC of AC	% PEC of A	Impact
E62	635634	165614	0	30	0.85	39.77	2.8%	132.6%	Not significant
E63	635696	165271	0	30	0.80	26.70	2.7%	89.0%	Not significant
E64	635212	165108	0	30	2.09	39.31	7.0%	131.0%	Not significant
E65	635302	164394	0	30	1.29	40.85	4.3%	136.2%	Not significant
E66	634825	164063	0	30	0.60	26.50	2.0%	88.3%	Not significant
E67	634369	163647	0	30	0.46	26.36	1.5%	87.9%	Not significant
E68	634218	163399	0	30	0.39	26.29	1.3%	87.6%	Not significant
E69	633122	163264	0	30	0.32	26.22	1.1%	87.4%	Not significant
E70	633581	165056	0	30	1.66	31.61	5.5%	105.4%	Not significant
E71	633420	165112	0	30	1.78	27.68	5.9%	92.3%	Not significant
E72	633441	164876	0	30	1.22	27.12	4.1%	90.4%	Not significant
E73	633330	164922	0	30	1.31	27.21	4.4%	90.7%	Not significant
E74	632062	164071	0	30	0.56	26.46	1.9%	88.2%	Not significant
E75	631267	164655	0	30	0.87	26.77	2.9%	89.2%	Not significant
E76	631135	164551	0	30	0.77	26.67	2.6%	88.9%	Not significant
E77	631149	166159	0	30	0.69	26.59	2.3%	88.6%	Not significant
E78	632034	166274	0	30	2.34	28.24	7.8%	94.1%	Not significant
E79	632106	166329	0	30	2.03	27.93	6.8%	93.1%	Not significant
E80	632102	166377	0	30	1.88	27.78	6.3%	92.6%	Not significant
E81	633049	166413	0	30	6.13	32.03	20.4%	106.8%	Not significant
E82	633119	166478	0	30	5.60	31.50	18.7%	105.0%	Not significant
E83	632891	166706	0	30	2.26	28.16	7.5%	93.9%	Not significant
E84	632763	166769	0	30	1.81	27.71	6.0%	92.4%	Not significant
E85	631105	168000	0	30	0.40	26.30	1.3%	87.7%	Not significant
E86	631260	168095	0	30	0.43	26.33	1.4%	87.8%	Not significant
E87	631603	168434	0	30	0.45	26.35	1.5%	87.8%	Not significant
E88	632016	168303	0	30	0.53	26.43	1.8%	88.1%	Not significant
M01	635931	165331	1.6	30	0.68	26.58	2.3%	88.6%	
M02	638483	165430	1.6	30	0.22	26.12	0.7%	87.1%	
M03	630284	169052	1.6	30	0.22	26.12	0.7%	87.1%	
M04	639019	167981	1.6	30	0.15	26.05	0.5%	86.8%	
M05	635539	169840	1.6	30	0.34	26.24	1.1%	87.5%	
M06	630254	169037	1.6	30	0.22	26.12	0.7%	87.1%	
M07	634445	164416	1.6	30	0.86	26.76	2.9%	89.2%	
M08	638492	165410	1.6	30	0.22	26.12	0.7%	87.1%	
M09	639097	165971	1.6	30	0.18	26.08	0.6%	86.9%	
M10	634662	166026	1.6	30	2.84	28.74	9.5%	95.8%	
M11	632984	166419	1.6	30	4.88	30.78	16.3%	102.6%	
M12	631161	165486	1.6	30	1.07	26.97	3.6%	89.9%	
M13	636570	167891	1.6	30	0.39	26.29	1.3%	87.6%	
M14	636405	168227	1.6	30	0.41	26.31	1.4%	87.7%	
M15	635932	165333	1.6	30	0.68	26.58	2.3%	88.6%	
M16	630438	169111	1.6	30	0.23	26.13	0.8%	87.1%	
M17	630186	168983	1.6	30	0.21	26.11	0.7%	87.0%	
M18	638616	165564	1.6	30	0.21	26.11	0.7%	87.0%	
M19	638472	165432	1.6	30	0.22	26.12	0.7%	87.1%	
M20	637135	165354	1.6	30	0.36	26.26	1.2%	87.5%	
M21	636815	167297	1.6	30	0.34	26.24	1.1%	87.5%	
M22	638220	168614	1.6	30	0.20	26.10	0.7%	87.0%	
M23	637112	165331	1.6	30	0.36	26.26	1.2%	87.5%	
M24	638536	165465	1.6	30	0.22	26.12	0.7%	87.1%	
M25	637092	165340	1.6	30	0.37	26.27	1.2%	87.6%	
M26	638528	165426	1.6	30	0.22	26.12	0.7%	87.1%	

Year 6. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E01	621048	168683	0	200	0.64	26.54	0.3%	13.3%	Not significant
E02	625191	169137	0	200	1.27	27.17	0.6%	13.6%	Not significant
E03	628533	169560	0	200	1.88	27.78	0.9%	13.9%	Not significant
E04	629867	169917	0	200	2.35	28.25	1.2%	14.1%	Not significant
E05	630740	169804	0	200	2.81	28.71	1.4%	14.4%	Not significant
E06	631813	170059	0	200	4.11	30.01	2.1%	15.0%	Not significant
E07	632683	170381	0	200	3.16	29.06	1.6%	14.5%	Not significant
E08	633993	170521	0	200	3.86	29.76	1.9%	14.9%	Not significant
E09	635116	170740	0	200	3.25	29.15	1.6%	14.6%	Not significant
E10	636457	171381	0	200	2.35	28.25	1.2%	14.1%	Not significant
E11	637964	171321	0	200	1.85	27.75	0.9%	13.9%	Not significant
E12	639028	171113	0	200	1.57	27.47	0.8%	13.7%	Not significant
E13	639841	170161	0	200	1.33	27.23	0.7%	13.6%	Not significant
E14	639882	168631	0	200	2.03	27.93	1.0%	14.0%	Not significant
E15	639810	167452	0	200	3.07	28.97	1.5%	14.5%	Not significant
E16	639527	166684	0	200	3.52	29.42	1.8%	14.7%	Not significant
E17	639241	165688	0	200	3.86	29.76	1.9%	14.9%	Not significant
E18	638891	165003	0	200	4.54	30.44	2.3%	15.2%	Not significant
E19	638595	164294	0	200	4.83	30.73	2.4%	15.4%	Not significant
E20	637303	164087	0	200	6.01	31.91	3.0%	16.0%	Not significant
E21	636318	164194	0	200	8.07	33.97	4.0%	17.0%	Not significant
E22	635298	164386	0	200	12.15	38.05	6.1%	19.0%	Not significant
E23	634800	164047	0	200	6.98	32.88	3.5%	16.4%	Not significant
E24	634346	163650	0	200	7.63	33.53	3.8%	16.8%	Not significant
E25	633796	162733	0	200	5.68	31.58	2.8%	15.8%	Not significant
E26	633703	162425	0	200	5.15	31.05	2.6%	15.5%	Not significant
E27	634513	161455	0	200	4.88	30.78	2.4%	15.4%	Not significant
E28	633502	161188	0	200	3.59	29.49	1.8%	14.7%	Not significant
E29	635337	160698	0	200	3.64	29.54	1.8%	14.8%	Not significant
E30	633692	159746	0	200	2.90	28.80	1.4%	14.4%	Not significant
E31	634794	159415	0	200	3.32	29.22	1.7%	14.6%	Not significant
E32	635708	159117	0	200	2.83	28.73	1.4%	14.4%	Not significant
E33	633607	158133	0	200	2.12	28.02	1.1%	14.0%	Not significant
E34	635539	157577	0	200	2.44	28.34	1.2%	14.2%	Not significant
E35	633584	156906	0	200	1.75	27.65	0.9%	13.8%	Not significant
E36	635214	156105	0	200	1.99	27.89	1.0%	13.9%	Not significant
E37	632347	155607	0	200	1.06	26.96	0.5%	13.5%	Not significant
E38	632033	163044	0	200	4.62	30.52	2.3%	15.3%	Not significant
E39	632554	162933	0	200	3.83	29.73	1.9%	14.9%	Not significant
E40	633412	162328	0	200	4.44	30.34	2.2%	15.2%	Not significant
E41	633527	162189	0	200	4.54	30.44	2.3%	15.2%	Not significant
E42	632364	162425	0	200	3.40	29.30	1.7%	14.7%	Not significant
E43	622112	162206	0	200	2.15	28.05	1.1%	14.0%	Not significant
E44	623126	162989	0	200	2.24	28.14	1.1%	14.1%	Not significant
E45	624052	162872	0	200	2.83	28.73	1.4%	14.4%	Not significant
E46	624096	162621	0	200	2.93	28.83	1.5%	14.4%	Not significant
E47	623938	162268	0	200	2.85	28.75	1.4%	14.4%	Not significant
E48	623648	161865	0	200	2.65	28.55	1.3%	14.3%	Not significant
E49	622879	161358	0	200	2.32	28.22	1.2%	14.1%	Not significant
E50	631694	164088	0	200	8.39	34.29	4.2%	17.1%	Not significant
E51	631458	164099	0	200	8.80	34.70	4.4%	17.3%	Not significant
E52	631039	164107	0	200	9.30	35.20	4.6%	17.6%	Not significant
E53	632436	162421	0	200	3.34	29.24	1.7%	14.6%	Not significant
E54	631908	162848	0	200	4.41	30.31	2.2%	15.2%	Not significant

Year 6. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E55	631008	162944	0	200	6.00	31.90	3.0%	15.9%	Not significant
E56	630479	164211	0	200	11.84	37.74	5.9%	18.9%	Not significant
E57	630389	164405	0	200	12.62	38.52	6.3%	19.3%	Not significant
E58	630172	164540	0	200	11.81	37.71	5.9%	18.9%	Not significant
E59	633116	169430	0	200	3.90	29.80	1.9%	14.9%	Not significant
E60	633976	168913	0	200	5.55	31.45	2.8%	15.7%	Not significant
E61	635881	166552	0	200	6.46	32.36	3.2%	16.2%	Not significant
E62	635634	165614	0	200	14.00	39.90	7.0%	20.0%	Not significant
E63	635696	165271	0	200	15.00	40.90	7.5%	20.5%	Not significant
E64	635212	165108	0	200	16.82	42.72	8.4%	21.4%	Not significant
E65	635302	164394	0	200	12.25	38.15	6.1%	19.1%	Not significant
E66	634825	164063	0	200	7.14	33.04	3.6%	16.5%	Not significant
E67	634369	163647	0	200	7.60	33.50	3.8%	16.8%	Not significant
E68	634218	163399	0	200	7.21	33.11	3.6%	16.6%	Not significant
E69	633122	163264	0	200	4.82	30.72	2.4%	15.4%	Not significant
E70	633581	165056	0	200	9.36	35.26	4.7%	17.6%	Not significant
E71	633420	165112	0	200	10.64	36.54	5.3%	18.3%	Not significant
E72	633441	164876	0	200	8.31	34.21	4.2%	17.1%	Not significant
E73	633330	164922	0	200	9.20	35.10	4.6%	17.6%	Not significant
E74	632062	164071	0	200	7.40	33.30	3.7%	16.7%	Not significant
E75	631267	164655	0	200	13.09	38.99	6.5%	19.5%	Not significant
E76	631135	164551	0	200	12.82	38.72	6.4%	19.4%	Not significant
E77	631149	166159	0	200	8.23	34.13	4.1%	17.1%	Not significant
E78	632034	166274	0	200	11.93	37.83	6.0%	18.9%	Not significant
E79	632106	166329	0	200	9.92	35.82	5.0%	17.9%	Not significant
E80	632102	166377	0	200	9.43	35.33	4.7%	17.7%	Not significant
E81	633049	166413	0	200	10.00	35.90	5.0%	18.0%	Not significant
E82	633119	166478	0	200	10.10	36.00	5.1%	18.0%	Not significant
E83	632891	166706	0	200	7.18	33.08	3.6%	16.5%	Not significant
E84	632763	166769	0	200	6.76	32.66	3.4%	16.3%	Not significant
E85	631105	168000	0	200	4.55	30.45	2.3%	15.2%	Not significant
E86	631260	168095	0	200	4.92	30.82	2.5%	15.4%	Not significant
E87	631603	168434	0	200	5.05	30.95	2.5%	15.5%	Not significant
E88	632016	168303	0	200	5.76	31.66	2.9%	15.8%	Not significant
M01	635931	165331	1.6	200	13.67	39.57	6.8%	19.8%	
M02	638483	165430	1.6	200	5.11	31.01	2.6%	15.5%	
M03	630284	169052	1.6	200	2.96	28.86	1.5%	14.4%	
M04	639019	167981	1.6	200	2.70	28.60	1.3%	14.3%	
M05	635539	169840	1.6	200	3.24	29.14	1.6%	14.6%	
M06	630254	169037	1.6	200	2.94	28.84	1.5%	14.4%	
M07	634445	164416	1.6	200	8.76	34.66	4.4%	17.3%	
M08	638492	165410	1.6	200	5.11	31.01	2.6%	15.5%	
M09	639097	165971	1.6	200	3.40	29.30	1.7%	14.7%	
M10	634662	166026	1.6	200	10.35	36.25	5.2%	18.1%	
M11	632984	166419	1.6	200	9.35	35.25	4.7%	17.6%	
M12	631161	165486	1.6	200	22.95	48.85	11.5%	24.4%	
M13	636570	167891	1.6	200	3.03	28.93	1.5%	14.5%	
M14	636405	168227	1.6	200	3.00	28.90	1.5%	14.5%	
M15	635932	165333	1.6	200	13.67	39.57	6.8%	19.8%	
M16	630438	169111	1.6	200	3.04	28.94	1.5%	14.5%	
M17	630186	168983	1.6	200	2.87	28.77	1.4%	14.4%	
M18	638616	165564	1.6	200	4.74	30.64	2.4%	15.3%	
M19	638472	165432	1.6	200	5.12	31.02	2.6%	15.5%	
M20	637135	165354	1.6	200	7.99	33.89	4.0%	16.9%	

Year 6. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
M21	636815	167297	1.6	200	3.68	29.58	1.8%	14.8%	
M22	638220	168614	1.6	200	2.09	27.99	1.0%	14.0%	
M23	637112	165331	1.6	200	8.05	33.95	4.0%	17.0%	
M24	638536	165465	1.6	200	4.99	30.89	2.5%	15.4%	
M25	637092	165340	1.6	200	8.11	34.01	4.1%	17.0%	
M26	638528	165426	1.6	200	5.05	30.95	2.5%	15.5%	

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	40	0.58	21.84	1.5%	54.6%	Negligible
H02	631165	166314	1.6	40	0.45	19.75	1.1%	49.4%	Negligible
H03	631186	166424	1.6	40	0.44	19.74	1.1%	49.3%	Negligible
H04	631003	166651	1.6	40	0.34	19.64	0.8%	49.1%	Negligible
H05	630864	166832	1.6	40	0.28	19.58	0.7%	49.0%	Negligible
H06	632086	166298	1.6	40	1.51	20.81	3.8%	52.0%	Negligible
H07	632159	166430	1.6	40	1.19	20.49	3.0%	51.2%	Negligible
H08	632489	166193	1.6	40	2.58	28.58	6.5%	71.5%	Slight
H09	632629	166210	1.6	40	3.19	31.67	8.0%	79.2%	Moderate
H10	633019	166385	1.6	40	4.54	30.42	11.3%	76.0%	Moderate
H11	633039	166403	1.6	40	4.48	28.86	11.2%	72.2%	Moderate
H12	633126	166502	1.6	40	3.64	25.73	9.1%	64.3%	Slight
H13	633285	166619	1.6	40	2.93	23.40	7.3%	58.5%	Slight
H14	633912	166981	1.6	40	1.48	23.37	3.7%	58.4%	Negligible
H15	634183	166374	1.6	40	2.48	24.43	6.2%	61.1%	Slight
H16	634509	166374	1.6	40	1.70	23.51	4.3%	58.8%	Negligible
H17	634621	166241	1.6	40	2.16	29.45	5.4%	73.6%	Negligible
H18	634640	166153	1.6	40	2.01	28.34	5.0%	70.9%	Negligible
H19	634680	166079	1.6	40	1.91	22.84	4.8%	57.1%	Negligible
H20	634651	165954	1.6	40	2.19	22.29	5.5%	55.7%	Negligible
H21	634584	165938	1.6	40	2.50	21.80	6.3%	54.5%	Slight
H22	634694	165880	1.6	40	2.19	21.49	5.5%	53.7%	Negligible
H23	634455	165807	1.6	40	3.66	22.96	9.2%	57.4%	Slight
H24	635028	166030	1.6	40	1.31	27.64	3.3%	69.1%	Negligible
H25	635479	166321	1.6	40	0.61	19.91	1.5%	49.8%	Negligible
H26	635757	166282	1.6	40	0.49	19.79	1.2%	49.5%	Negligible
H27	636106	166044	1.6	40	0.39	19.69	1.0%	49.2%	Negligible
H28	636063	165787	1.6	40	0.46	25.35	1.1%	63.4%	Negligible
H29	635661	165661	1.6	40	0.56	19.86	1.4%	49.7%	Negligible
H30	635606	165627	1.6	40	0.59	19.89	1.5%	49.7%	Negligible
H31	635903	165323	1.6	40	0.48	19.78	1.2%	49.5%	Negligible
H32	635777	165134	1.6	40	0.55	27.60	1.4%	69.0%	Negligible
H33	634774	165056	1.6	40	1.19	20.49	3.0%	51.2%	Negligible
H34	634770	165249	1.6	40	1.52	20.82	3.8%	52.0%	Negligible
H35	634726	165251	1.6	40	1.64	20.94	4.1%	52.3%	Negligible
H36	634682	165251	1.6	40	1.76	21.06	4.4%	52.7%	Negligible
H37	634646	165253	1.6	40	1.88	21.18	4.7%	53.0%	Negligible
H38	634602	165260	1.6	40	2.06	21.36	5.1%	53.4%	Negligible
H39	634603	165217	1.6	40	1.87	21.17	4.7%	52.9%	Negligible
H40	634601	165182	1.6	40	1.73	21.03	4.3%	52.6%	Negligible
H41	634599	165138	1.6	40	1.58	20.88	3.9%	52.2%	Negligible
H42	634596	165101	1.6	40	1.47	20.77	3.7%	51.9%	Negligible
H43	634450	165100	1.6	40	1.62	20.92	4.1%	52.3%	Negligible
H44	634382	165134	1.6	40	1.73	21.03	4.3%	52.6%	Negligible
H45	634518	164793	1.6	40	0.94	23.05	2.4%	57.6%	Negligible
H46	633418	164980	1.6	40	0.99	20.29	2.5%	50.7%	Negligible
H47	633287	164842	1.6	40	0.82	20.12	2.0%	50.3%	Negligible
H48	633076	164912	1.6	40	0.89	20.19	2.2%	50.5%	Negligible
H49	632465	165443	1.6	40	1.72	24.97	4.3%	62.4%	Negligible
H50	632426	165384	1.6	40	1.50	23.17	3.8%	57.9%	Negligible
H51	632378	165324	1.6	40	1.32	20.62	3.3%	51.5%	Negligible

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H52	632242	165162	1.6	40	1.00	20.30	2.5%	50.7%	Negligible
H53	632166	165091	1.6	40	0.91	20.21	2.3%	50.5%	Negligible
H54	632064	165515	1.6	40	1.68	26.15	4.2%	65.4%	Negligible
H55	632023	165273	1.6	40	1.14	20.44	2.8%	51.1%	Negligible
H56	631079	165231	1.6	40	0.65	19.95	1.6%	49.9%	Negligible
H57	630849	165341	1.6	40	0.55	19.85	1.4%	49.6%	Negligible
H58	631238	165328	1.6	40	0.78	20.08	1.9%	50.2%	Negligible
H59	631258	165433	1.6	40	0.82	20.12	2.1%	50.3%	Negligible
H60	631203	165516	1.6	40	0.79	22.05	2.0%	55.1%	Negligible
H61	631139	165561	1.6	40	0.75	22.46	1.9%	56.2%	Negligible
H62	631045	165700	1.6	40	0.66	26.88	1.6%	67.2%	Negligible
H63	631091	165778	1.6	40	0.63	19.93	1.6%	49.8%	Negligible
H64	631111	165805	1.6	40	1.11	26.44	2.8%	66.1%	Negligible
H65	631115	165852	1.6	40	0.89	27.43	2.2%	68.6%	Negligible
H66	631061	165470	1.6	40	0.68	19.98	1.7%	49.9%	Negligible
H67	634597	166287	1.6	40	1.71	21.01	4.3%	52.5%	Negligible
H68	635335	165657	1.6	40	0.76	20.06	1.9%	50.1%	Negligible
H69	634417	165213	1.6	40	2.20	21.50	5.5%	53.7%	Negligible
H70	631268	165516	1.6	40	0.86	22.36	2.2%	55.9%	Negligible
A01	628199	169135	1.6	40	0.07	19.37	0.2%	48.4%	Negligible
A02	629810	168213	1.6	40	0.13	19.43	0.3%	48.6%	Negligible
A03	630337	168165	1.6	40	0.18	19.48	0.4%	48.7%	Negligible
A04	631554	168915	1.6	40	0.27	19.57	0.7%	48.9%	Negligible
A05	632410	169167	1.6	40	0.27	19.57	0.7%	48.9%	Negligible
A06	633542	169294	1.6	40	0.29	19.59	0.7%	49.0%	Negligible
A07	635052	169313	1.6	40	0.30	19.60	0.8%	49.0%	Negligible
A08	635998	168591	1.6	40	0.31	19.61	0.8%	49.0%	Negligible
A09	635909	167560	1.6	40	0.40	19.70	1.0%	49.2%	Negligible
A10	635754	166743	1.6	40	0.48	19.78	1.2%	49.5%	Negligible
A11	635574	165975	1.6	40	0.59	19.89	1.5%	49.7%	Negligible
A12	635125	165203	1.6	40	0.92	20.22	2.3%	50.5%	Negligible
A13	634752	165243	1.6	40	1.55	20.85	3.9%	52.1%	Negligible
A14	634369	165285	1.6	40	2.69	21.99	6.7%	55.0%	Slight
A15	634356	165091	1.6	40	1.54	20.84	3.9%	52.1%	Negligible
A16	634362	164473	1.6	40	0.62	19.92	1.6%	49.8%	Negligible
A17	634276	164112	1.6	40	0.44	19.74	1.1%	49.3%	Negligible
A18	634556	163810	1.6	40	0.36	19.66	0.9%	49.2%	Negligible
A19	634834	164066	1.6	40	0.42	19.72	1.0%	49.3%	Negligible
A20	635064	163939	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
A21	635416	164358	1.6	40	0.48	19.78	1.2%	49.4%	Negligible
A22	630226	169070	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A23	630235	169089	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A24	630253	169081	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A25	630270	169076	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A26	630288	169071	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A27	630308	169071	1.6	40	0.16	35.46	0.4%	88.6%	Negligible
A28	630308	169058	1.6	40	0.16	35.46	0.4%	88.6%	Negligible
A29	630290	169050	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A30	630276	169045	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A31	630254	169033	1.6	40	0.15	35.45	0.4%	88.6%	Negligible
A32	637052	165324	1.6	40	0.26	38.26	0.7%	95.7%	Slight

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A33	637046	165372	1.6	40	0.26	38.26	0.7%	95.7%	Slight
A34	637074	165376	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A35	637065	165340	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A36	637075	165331	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A37	637104	165345	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A38	637140	165328	1.6	40	0.25	38.25	0.6%	95.6%	Slight
A39	637119	165323	1.6	40	0.25	38.25	0.6%	95.6%	Slight
A40	637099	165327	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A41	637082	165319	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A42	637085	165289	1.6	40	0.26	38.26	0.6%	95.6%	Slight
A43	637063	165280	1.6	40	0.26	38.26	0.7%	95.7%	Slight
M01	635931	165331	1.6	40	0.47	19.77	1.2%	49.4%	Negligible
M02	638483	165430	1.6	40	0.16	19.46	0.4%	48.6%	Negligible
M03	630284	169052	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M04	639019	167981	1.6	40	0.11	19.41	0.3%	48.5%	Negligible
M05	635539	169840	1.6	40	0.24	19.54	0.6%	48.9%	Negligible
M06	630254	169037	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M07	634445	164416	1.6	40	0.60	19.90	1.5%	49.8%	Negligible
M08	638492	165410	1.6	40	0.16	19.46	0.4%	48.6%	Negligible
M09	639097	165971	1.6	40	0.12	19.42	0.3%	48.6%	Negligible
M10	634662	166026	1.6	40	1.99	21.29	5.0%	53.2%	Negligible
M11	632984	166419	1.6	40	3.41	22.71	8.5%	56.8%	Slight
M12	631161	165486	1.6	40	0.75	20.05	1.9%	50.1%	Negligible
M13	636570	167891	1.6	40	0.27	19.57	0.7%	48.9%	Negligible
M14	636405	168227	1.6	40	0.29	19.59	0.7%	49.0%	Negligible
M15	635932	165333	1.6	40	0.47	19.77	1.2%	49.4%	Negligible
M16	630438	169111	1.6	40	0.16	19.46	0.4%	48.7%	Negligible
M17	630186	168983	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M18	638616	165564	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M19	638472	165432	1.6	40	0.16	19.46	0.4%	48.6%	Negligible
M20	637135	165354	1.6	40	0.25	19.55	0.6%	48.9%	Negligible
M21	636815	167297	1.6	40	0.24	19.54	0.6%	48.9%	Negligible
M22	638220	168614	1.6	40	0.14	19.44	0.3%	48.6%	Negligible
M23	637112	165331	1.6	40	0.25	19.55	0.6%	48.9%	Negligible
M24	638536	165465	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M25	637092	165340	1.6	40	0.26	19.56	0.6%	48.9%	Negligible
M26	638528	165426	1.6	40	0.15	19.45	0.4%	48.6%	Negligible
M27	634752	170679	1.6	40	0.20	19.50	0.5%	48.7%	Negligible

Year 6. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (μg n	PC (μg m−3	PEC (μg m−	% PC of AQ	% PEC of A	Impact
H01	631215	166224	1.6	200	12.05	31.35	6.0%	15.7%	
H02	631165	166314	1.6	200	10.36	29.66	5.2%	14.8%	
H03	631186	166424	1.6	200	13.39	32.69	6.7%	16.3%	
H04	631003	166651	1.6	200	12.85	32.15	6.4%	16.1%	
H05	630864	166832	1.6	200	10.48	29.78	5.2%	14.9%	
H06	632086	166298	1.6	200	15.07	34.37	7.5%	17.2%	
H07	632159	166430	1.6	200	12.71	32.01	6.4%	16.0%	
H08	632489	166193	1.6	200	10.50	29.80	5.2%	14.9%	
H09	632629	166210	1.6	200	9.77	29.07	4.9%	14.5%	
H10	633019	166385	1.6	200	11.01	30.31	5.5%	15.2%	
H11	633039	166403	1.6	200	12.05	31.35	6.0%	15.7%	
H12	633126	166502	1.6	200	11.27	30.57	5.6%	15.3%	
H13	633285	166619	1.6	200	10.08	29.38	5.0%	14.7%	
H14	633912	166981	1.6	200	11.06	30.36	5.5%	15.2%	
H15	634183	166374	1.6	200	14.11	33.41	7.1%	16.7%	
H16	634509	166374	1.6	200	16.23	35.53	8.1%	17.8%	
H17	634621	166241	1.6	200	14.08	33.38	7.0%	16.7%	
H18	634640	166153	1.6	200	14.80	34.10	7.4%	17.1%	
H19	634680	166079	1.6	200	14.86	34.16	7.4%	17.1%	
H20	634651	165954	1.6	200	15.19	34.49	7.6%	17.2%	
H21	634584	165938	1.6	200	16.87	36.17	8.4%	18.1%	
H22	634694	165880	1.6	200	16.31	35.61	8.2%	17.8%	
H23	634455	165807	1.6	200	18.89	38.19	9.4%	19.1%	
H24	635028	166030	1.6	200	15.07	34.37	7.5%	17.2%	
H25	635479	166321	1.6	200	13.30	32.60	6.6%	16.3%	
H26	635757	166282	1.6	200	11.67	30.97	5.8%	15.5%	
H27	636106	166044	1.6	200	11.46	30.76	5.7%	15.4%	
H28	636063	165787	1.6	200	12.70	32.00	6.4%	16.0%	
H29	635661	165661	1.6	200	16.43	35.73	8.2%	17.9%	
H30	635606	165627	1.6	200	16.20	35.50	8.1%	17.7%	
H31	635903	165323	1.6	200	16.67	35.97	8.3%	18.0%	
H32	635777	165134	1.6	200	19.18	38.48	9.6%	19.2%	
H33	634774	165056	1.6	200	28.04	47.34	14.0%	23.7%	
H34	634770	165249	1.6	200	37.93	57.23	19.0%	28.6%	
H35	634726	165251	1.6	200	36.74	56.04	18.4%	28.0%	
H36	634682	165251	1.6	200	39.30	58.60	19.6%	29.3%	
H37	634646	165253	1.6	200	38.40	57.70	19.2%	28.9%	
H38	634602	165260	1.6	200	36.20	55.50	18.1%	27.7%	
H39	634603	165217	1.6	200	33.36	52.66	16.7%	26.3%	
H40	634601	165182	1.6	200	30.04	49.34	15.0%	24.7%	
H41	634599	165138	1.6	200	27.32	46.62	13.7%	23.3%	
H42	634596	165101	1.6	200	25.71	45.01	12.9%	22.5%	
H43	634450	165100	1.6	200	24.60	43.90	12.3%	22.0%	
H44	634382	165134	1.6	200	25.62	44.92	12.8%	22.5%	
H45	634518	164793	1.6	200	17.00	36.30	8.5%	18.2%	
H46	633418	164980	1.6	200	11.65	30.95	5.8%	15.5%	
H47	633287	164842	1.6	200	11.54	30.84	5.8%	15.4%	
H48	633076	164912	1.6	200	10.00	29.30	5.0%	14.7%	
H49	632465	165443	1.6	200	14.59	33.89	7.3%	16.9%	

Year 6. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H50	632426	165384	1.6	200	14.64	33.94	7.3%	17.0%	
H51	632378	165324	1.6	200	14.64	33.94	7.3%	17.0%	
H52	632242	165162	1.6	200	13.21	32.51	6.6%	16.3%	
H53	632166	165091	1.6	200	12.10	31.40	6.1%	15.7%	
H54	632064	165515	1.6	200	17.91	37.21	9.0%	18.6%	
H55	632023	165273	1.6	200	14.27	33.57	7.1%	16.8%	
H56	631079	165231	1.6	200	19.24	38.54	9.6%	19.3%	
H57	630849	165341	1.6	200	19.93	39.23	10.0%	19.6%	
H58	631238	165328	1.6	200	22.02	41.32	11.0%	20.7%	
H59	631258	165433	1.6	200	24.53	43.83	12.3%	21.9%	
H60	631203	165516	1.6	200	24.20	43.50	12.1%	21.8%	
H61	631139	165561	1.6	200	26.26	45.56	13.1%	22.8%	
H62	631045	165700	1.6	200	30.49	49.79	15.2%	24.9%	
H63	631091	165778	1.6	200	26.45	45.75	13.2%	22.9%	
H64	631111	165805	1.6	200	28.23	47.53	14.1%	23.8%	
H65	631115	165852	1.6	200	27.46	46.76	13.7%	23.4%	
H66	631061	165470	1.6	200	22.48	41.78	11.2%	20.9%	
H67	634597	166287	1.6	200	14.26	33.56	7.1%	16.8%	
H68	635335	165657	1.6	200	21.05	40.35	10.5%	20.2%	
H69	634417	165213	1.6	200	28.53	47.83	14.3%	23.9%	
H70	631268	165516	1.6	200	28.28	47.58	14.1%	23.8%	
S01	633172	166482	1.6	200	11.60	30.90	5.8%	15.5%	
S02	633258	166471	1.6	200	11.38	30.68	5.7%	15.3%	
S03	633351	166555	1.6	200	12.03	31.33	6.0%	15.7%	
S04	634633	165956	1.6	200	16.04	35.34	8.0%	17.7%	
S05	635743	166131	1.6	200	12.92	32.22	6.5%	16.1%	
S06	636110	165647	1.6	200	12.59	31.89	6.3%	15.9%	
S07	631121	165603	1.6	200	26.43	45.73	13.2%	22.9%	
S08	631189	165670	1.6	200	34.32	53.62	17.2%	26.8%	
A01	628199	169135	1.6	200	2.71	22.01	1.4%	11.0%	
A02	629810	168213	1.6	200	6.66	25.96	3.3%	13.0%	
A03	630337	168165	1.6	200	6.22	25.52	3.1%	12.8%	
A04	631554	168915	1.6	200	7.88	27.18	3.9%	13.6%	
A05	632410	169167	1.6	200	7.78	27.08	3.9%	13.5%	
A06	633542	169294	1.6	200	6.70	26.00	3.4%	13.0%	
A07	635052	169313	1.6	200	5.91	25.21	3.0%	12.6%	
A08	635998	168591	1.6	200	6.04	25.34	3.0%	12.7%	
A09	635909	167560	1.6	200	6.85	26.15	3.4%	13.1%	
A10	635754	166743	1.6	200	10.67	29.97	5.3%	15.0%	
A11	635574	165975	1.6	200	13.39	32.69	6.7%	16.3%	
A12	635125	165203	1.6	200	31.99	51.29	16.0%	25.6%	
A13	634752	165243	1.6	200	36.79	56.09	18.4%	28.0%	
A14	634369	165285	1.6	200	30.78	50.08	15.4%	25.0%	
A15	634356	165091	1.6	200	24.93	44.23	12.5%	22.1%	
A16	634362	164473	1.6	200	13.30	32.60	6.6%	16.3%	
A17	634276	164112	1.6	200	11.65	30.95	5.8%	15.5%	
A18	634556	163810	1.6	200	11.30	30.60	5.6%	15.3%	
A19	634834	164066	1.6	200	12.45	31.75	6.2%	15.9%	
A20	635064	163939	1.6	200	13.55	32.85	6.8%	16.4%	

Year 6. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A21	635416	164358	1.6	200	17.93	37.23	9.0%	18.6%	
A22	630226	169070	1.6	200	5.56	40.86	2.8%	20.4%	
A23	630235	169089	1.6	200	5.58	40.88	2.8%	20.4%	
A24	630253	169081	1.6	200	5.63	40.93	2.8%	20.5%	
A25	630270	169076	1.6	200	5.71	41.01	2.9%	20.5%	
A26	630288	169071	1.6	200	5.85	41.15	2.9%	20.6%	
A27	630308	169071	1.6	200	6.02	41.32	3.0%	20.7%	
A28	630308	169058	1.6	200	5.98	41.28	3.0%	20.6%	
A29	630290	169050	1.6	200	5.80	41.10	2.9%	20.5%	
A30	630276	169045	1.6	200	5.69	40.99	2.8%	20.5%	
A31	630254	169033	1.6	200	5.63	40.93	2.8%	20.5%	
A32	637052	165324	1.6	200	11.17	49.17	5.6%	24.6%	
A33	637046	165372	1.6	200	11.61	49.61	5.8%	24.8%	
A34	637074	165376	1.6	200	11.54	49.54	5.8%	24.8%	
A35	637065	165340	1.6	200	11.36	49.36	5.7%	24.7%	
A36	637075	165331	1.6	200	11.20	49.20	5.6%	24.6%	
A37	637104	165345	1.6	200	11.31	49.31	5.7%	24.7%	
A38	637140	165328	1.6	200	10.98	48.98	5.5%	24.5%	
A39	637119	165323	1.6	200	10.97	48.97	5.5%	24.5%	
A40	637099	165327	1.6	200	11.08	49.08	5.5%	24.5%	
A41	637082	165319	1.6	200	11.02	49.02	5.5%	24.5%	
A42	637085	165289	1.6	200	10.57	48.57	5.3%	24.3%	
A43	637063	165280	1.6	200	10.49	48.49	5.2%	24.2%	
M01	635931	165331	1.6	200	16.23	35.53	8.1%	17.8%	
M02	638483	165430	1.6	200	7.08	26.38	3.5%	13.2%	
M03	630284	169052	1.6	200	5.75	25.05	2.9%	12.5%	
M04	639019	167981	1.6	200	4.73	24.03	2.4%	12.0%	
M05	635539	169840	1.6	200	5.61	24.91	2.8%	12.5%	
M06	630254	169037	1.6	200	5.63	24.93	2.8%	12.5%	
M07	634445	164416	1.6	200	13.46	32.76	6.7%	16.4%	
M08	638492	165410	1.6	200	6.98	26.28	3.5%	13.1%	
M09	639097	165971	1.6	200	5.02	24.32	2.5%	12.2%	
M10	634662	166026	1.6	200	15.21	34.51	7.6%	17.3%	
M11	632984	166419	1.6	200	10.46	29.76	5.2%	14.9%	
M12	631161	165486	1.6	200	24.31	43.61	12.2%	21.8%	
M13	636570	167891	1.6	200	6.05	25.35	3.0%	12.7%	
M14	636405	168227	1.6	200	6.11	25.41	3.1%	12.7%	
M15	635932	165333	1.6	200	16.18	35.48	8.1%	17.7%	
M16	630438	169111	1.6	200	6.10	25.40	3.1%	12.7%	
M17	630186	168983	1.6	200	5.52	24.82	2.8%	12.4%	
M18	638616	165564	1.6	200	6.02	25.32	3.0%	12.7%	
M19	638472	165432	1.6	200	7.11	26.41	3.6%	13.2%	
M20	637135	165354	1.6	200	11.28	30.58	5.6%	15.3%	
M21	636815	167297	1.6	200	6.50	25.80	3.3%	12.9%	
M22	638220	168614	1.6	200	3.60	22.90	1.8%	11.5%	
M23	637112	165331	1.6	200	11.10	30.40	5.6%	15.2%	
M24	638536	165465	1.6	200	6.95	26.25	3.5%	13.1%	
M25	637092	165340	1.6	200	11.28	30.58	5.6%	15.3%	
M26	638528	165426	1.6	200	6.99	26.29	3.5%	13.1%	

Year 6. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	200	6.25	25.55	3.1%	12.8%	

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	40	0.05	18.79	0.1%	47.0%	Negligible
H02	631165	166314	1.6	40	0.04	18.49	0.1%	46.2%	Negligible
H03	631186	166424	1.6	40	0.03	18.49	0.1%	46.2%	Negligible
H04	631003	166651	1.6	40	0.03	18.48	0.1%	46.2%	Negligible
H05	630864	166832	1.6	40	0.02	16.92	0.1%	42.3%	Negligible
H06	632086	166298	1.6	40	0.21	16.17	0.5%	40.4%	Negligible
H07	632159	166430	1.6	40	0.15	16.12	0.4%	40.3%	Negligible
H08	632489	166193	1.6	40	0.19	17.18	0.5%	42.9%	Negligible
H09	632629	166210	1.6	40	0.25	17.64	0.6%	44.1%	Negligible
H10	633019	166385	1.6	40	0.31	15.98	0.8%	40.0%	Negligible
H11	633039	166403	1.6	40	0.31	15.75	0.8%	39.4%	Negligible
H12	633126	166502	1.6	40	0.24	15.32	0.6%	38.3%	Negligible
H13	633285	166619	1.6	40	0.18	15.03	0.5%	37.6%	Negligible
H14	633912	166981	1.6	40	0.10	15.16	0.2%	37.9%	Negligible
H15	634183	166374	1.6	40	0.22	16.34	0.5%	40.8%	Negligible
H16	634509	166374	1.6	40	0.17	16.28	0.4%	40.7%	Negligible
H17	634621	166241	1.6	40	0.25	17.25	0.6%	43.1%	Negligible
H18	634640	166153	1.6	40	0.22	17.06	0.5%	42.6%	Negligible
H19	634680	166079	1.6	40	0.20	16.17	0.5%	40.4%	Negligible
H20	634651	165954	1.6	40	0.21	16.02	0.5%	40.1%	Negligible
H21	634584	165938	1.6	40	0.25	15.94	0.6%	39.8%	Negligible
H22	634694	165880	1.6	40	0.19	15.87	0.5%	39.7%	Negligible
H23	634455	165807	1.6	40	0.39	16.08	1.0%	40.2%	Negligible
H24	635028	166030	1.6	40	0.13	17.85	0.3%	44.6%	Negligible
H25	635479	166321	1.6	40	0.05	16.66	0.1%	41.6%	Negligible
H26	635757	166282	1.6	40	0.04	16.65	0.1%	41.6%	Negligible
H27	636106	166044	1.6	40	0.03	15.25	0.1%	38.1%	Negligible
H28	636063	165787	1.6	40	0.04	16.18	0.1%	40.4%	Negligible
H29	635661	165661	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
H30	635606	165627	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
H31	635903	165323	1.6	40	0.04	16.95	0.1%	42.4%	Negligible
H32	635777	165134	1.6	40	0.05	18.28	0.1%	45.7%	Negligible
H33	634774	165056	1.6	40	0.11	15.79	0.3%	39.5%	Negligible
H34	634770	165249	1.6	40	0.13	15.81	0.3%	39.5%	Negligible
H35	634726	165251	1.6	40	0.14	15.82	0.3%	39.6%	Negligible
H36	634682	165251	1.6	40	0.15	15.83	0.4%	39.6%	Negligible
H37	634646	165253	1.6	40	0.16	15.84	0.4%	39.6%	Negligible
H38	634602	165260	1.6	40	0.17	15.86	0.4%	39.6%	Negligible
H39	634603	165217	1.6	40	0.16	15.85	0.4%	39.6%	Negligible
H40	634601	165182	1.6	40	0.15	15.84	0.4%	39.6%	Negligible
H41	634599	165138	1.6	40	0.14	15.83	0.4%	39.6%	Negligible
H42	634596	165101	1.6	40	0.14	15.82	0.3%	39.6%	Negligible
H43	634450	165100	1.6	40	0.15	15.84	0.4%	39.6%	Negligible
H44	634382	165134	1.6	40	0.18	15.86	0.4%	39.7%	Negligible
H45	634518	164793	1.6	40	0.08	16.26	0.2%	40.7%	Negligible
H46	633418	164980	1.6	40	0.05	16.53	0.1%	41.3%	Negligible
H47	633287	164842	1.6	40	0.04	16.52	0.1%	41.3%	Negligible
H48	633076	164912	1.6	40	0.05	16.53	0.1%	41.3%	Negligible
H49	632465	165443	1.6	40	0.08	16.99	0.2%	42.5%	Negligible
H50	632426	165384	1.6	40	0.07	16.77	0.2%	41.9%	Negligible
H51	632378	165324	1.6	40	0.06	16.45	0.2%	41.1%	Negligible

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H52	632242	165162	1.6	40	0.06	16.45	0.1%	41.1%	Negligible
H53	632166	165091	1.6	40	0.06	16.45	0.2%	41.1%	Negligible
H54	632064	165515	1.6	40	0.32	17.40	0.8%	43.5%	Negligible
H55	632023	165273	1.6	40	0.15	16.54	0.4%	41.3%	Negligible
H56	631079	165231	1.6	40	0.05	16.91	0.1%	42.3%	Negligible
H57	630849	165341	1.6	40	0.05	16.50	0.1%	41.2%	Negligible
H58	631238	165328	1.6	40	0.07	16.92	0.2%	42.3%	Negligible
H59	631258	165433	1.6	40	0.07	16.92	0.2%	42.3%	Negligible
H60	631203	165516	1.6	40	0.07	17.18	0.2%	43.0%	Negligible
H61	631139	165561	1.6	40	0.06	17.24	0.2%	43.1%	Negligible
H62	631045	165700	1.6	40	0.06	17.84	0.1%	44.6%	Negligible
H63	631091	165778	1.6	40	0.05	16.90	0.1%	42.3%	Negligible
H64	631111	165805	1.6	40	0.13	17.90	0.3%	44.7%	Negligible
H65	631115	165852	1.6	40	0.09	18.06	0.2%	45.1%	Negligible
H66	631061	165470	1.6	40	0.06	16.91	0.1%	42.3%	Negligible
H67	634597	166287	1.6	40	0.17	15.89	0.4%	39.7%	Negligible
H68	635335	165657	1.6	40	0.06	16.97	0.2%	42.4%	Negligible
H69	634417	165213	1.6	40	0.22	15.90	0.5%	39.8%	Negligible
H70	631268	165516	1.6	40	0.07	17.22	0.2%	43.0%	Negligible
A01	628199	169135	1.6	40	0.01	14.29	0.0%	35.7%	Negligible
A02	629810	168213	1.6	40	0.01	15.98	0.0%	40.0%	Negligible
A03	630337	168165	1.6	40	0.01	15.54	0.0%	38.9%	Negligible
A04	631554	168915	1.6	40	0.02	16.40	0.1%	41.0%	Negligible
A05	632410	169167	1.6	40	0.02	15.46	0.0%	38.6%	Negligible
A06	633542	169294	1.6	40	0.02	15.72	0.0%	39.3%	Negligible
A07	635052	169313	1.6	40	0.02	14.77	0.1%	36.9%	Negligible
A08	635998	168591	1.6	40	0.02	16.06	0.1%	40.1%	Negligible
A09	635909	167560	1.6	40	0.03	16.57	0.1%	41.4%	Negligible
A10	635754	166743	1.6	40	0.04	16.65	0.1%	41.6%	Negligible
A11	635574	165975	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
A12	635125	165203	1.6	40	0.08	16.99	0.2%	42.5%	Negligible
A13	634752	165243	1.6	40	0.13	15.82	0.3%	39.5%	Negligible
A14	634369	165285	1.6	40	0.29	15.97	0.7%	39.9%	Negligible
A15	634356	165091	1.6	40	0.16	15.84	0.4%	39.6%	Negligible
A16	634362	164473	1.6	40	0.06	15.77	0.1%	39.4%	Negligible
A17	634276	164112	1.6	40	0.04	15.76	0.1%	39.4%	Negligible
A18	634556	163810	1.6	40	0.03	14.51	0.1%	36.3%	Negligible
A19	634834	164066	1.6	40	0.03	15.75	0.1%	39.4%	Negligible
A20	635064	163939	1.6	40	0.03	13.89	0.1%	34.7%	Negligible
A21	635416	164358	1.6	40	0.04	15.89	0.1%	39.7%	Negligible
A22	630226	169070	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A23	630235	169089	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A24	630253	169081	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A25	630270	169076	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A26	630288	169071	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A27	630308	169071	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A28	630308	169058	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A29	630290	169050	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A30	630276	169045	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A31	630254	169033	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
A32	637052	165324	1.6	40	0.02	15.14	0.1%	37.8%	Negligible

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A33	637046	165372	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A34	637074	165376	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A35	637065	165340	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A36	637075	165331	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A37	637104	165345	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A38	637140	165328	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A39	637119	165323	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A40	637099	165327	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A41	637082	165319	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A42	637085	165289	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
A43	637063	165280	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
M01	635931	165331	1.6	40	0.04	16.95	0.1%	42.4%	Negligible
M02	638483	165430	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M03	630284	169052	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
M04	639019	167981	1.6	40	0.01	14.70	0.0%	36.8%	Negligible
M05	635539	169840	1.6	40	0.02	14.76	0.0%	36.9%	Negligible
M06	630254	169037	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
M07	634445	164416	1.6	40	0.05	15.77	0.1%	39.4%	Negligible
M08	638492	165410	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M09	639097	165971	1.6	40	0.01	13.72	0.0%	34.3%	Negligible
M10	634662	166026	1.6	40	0.20	15.92	0.5%	39.8%	Negligible
M11	632984	166419	1.6	40	0.21	16.18	0.5%	40.4%	Negligible
M12	631161	165486	1.6	40	0.06	16.92	0.2%	42.3%	Negligible
M13	636570	167891	1.6	40	0.02	16.18	0.1%	40.5%	Negligible
M14	636405	168227	1.6	40	0.02	16.58	0.1%	41.5%	Negligible
M15	635932	165333	1.6	40	0.04	16.95	0.1%	42.4%	Negligible
M16	630438	169111	1.6	40	0.01	14.63	0.0%	36.6%	Negligible
M17	630186	168983	1.6	40	0.01	15.54	0.0%	38.8%	Negligible
M18	638616	165564	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M19	638472	165432	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M20	637135	165354	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
M21	636815	167297	1.6	40	0.02	16.18	0.0%	40.4%	Negligible
M22	638220	168614	1.6	40	0.01	15.00	0.0%	37.5%	Negligible
M23	637112	165331	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
M24	638536	165465	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M25	637092	165340	1.6	40	0.02	15.14	0.1%	37.8%	Negligible
M26	638528	165426	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M27	634752	170679	1.6	40	0.01	14.51	0.0%	36.3%	Negligible

Year 6. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
H01	631215	166224	1.6	35	2	6.0%	
H02	631165	166314	1.6	35	2	5.2%	
H03	631186	166424	1.6	35	2	5.2%	
H04	631003	166651	1.6	35	2	5.1%	
H05	630864	166832	1.6	35	1	2.0%	
H06	632086	166298	1.6	35	0	1.1%	
H07	632159	166430	1.6	35	0	1.0%	
H08	632489	166193	1.6	35	1	2.4%	
H09	632629	166210	1.6	35	1	3.2%	
H10	633019	166385	1.6	35	0	0.9%	
H11	633039	166403	1.6	35	0	0.7%	
H12	633126	166502	1.6	35	0	0.5%	
H13	633285	166619	1.6	35	0	0.4%	
H14	633912	166981	1.6	35	0	0.4%	
H15	634183	166374	1.6	35	0	1.2%	
H16	634509	166374	1.6	35	0	1.2%	
H17	634621	166241	1.6	35	1	2.5%	
H18	634640	166153	1.6	35	1	2.2%	
H19	634680	166079	1.6	35	0	1.1%	
H20	634651	165954	1.6	35	0	0.9%	
H21	634584	165938	1.6	35	0	0.8%	
H22	634694	165880	1.6	35	0	0.8%	
H23	634455	165807	1.6	35	0	1.0%	
H24	635028	166030	1.6	35	1	3.7%	
H25	635479	166321	1.6	35	1	1.6%	
H26	635757	166282	1.6	35	1	1.6%	
H27	636106	166044	1.6	35	0	0.4%	
H28	636063	165787	1.6	35	0	1.1%	
H29	635661	165661	1.6	35	1	2.1%	
H30	635606	165627	1.6	35	1	2.1%	
H31	635903	165323	1.6	35	1	2.0%	
H32	635777	165134	1.6	35	2	4.6%	
H33	634774	165056	1.6	35	0	0.7%	
H34	634770	165249	1.6	35	0	0.7%	
H35	634726	165251	1.6	35	0	0.8%	
H36	634682	165251	1.6	35	0	0.8%	
H37	634646	165253	1.6	35	0	0.8%	
H38	634602	165260	1.6	35	0	0.8%	
H39	634603	165217	1.6	35	0	0.8%	
H40	634601	165182	1.6	35	0	0.8%	
H41	634599	165138	1.6	35	0	0.8%	
H42	634596	165101	1.6	35	0	0.8%	
H43	634450	165100	1.6	35	0	0.8%	
H44	634382	165134	1.6	35	0	0.8%	
H45	634518	164793	1.6	35	0	1.2%	
H46	633418	164980	1.6	35	1	1.5%	
H47	633287	164842	1.6	35	1	1.5%	
H48	633076	164912	1.6	35	1	1.5%	
H49	632465	165443	1.6	35	1	2.1%	

Year 6. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
H50	632426	165384	1.6	35	1	1.8%	
H51	632378	165324	1.6	35	0	1.4%	
H52	632242	165162	1.6	35	0	1.4%	
H53	632166	165091	1.6	35	0	1.4%	
H54	632064	165515	1.6	35	1	2.8%	
H55	632023	165273	1.6	35	1	1.5%	
H56	631079	165231	1.6	35	1	2.0%	
H57	630849	165341	1.6	35	0	1.4%	
H58	631238	165328	1.6	35	1	2.0%	
H59	631258	165433	1.6	35	1	2.0%	
H60	631203	165516	1.6	35	1	2.4%	
H61	631139	165561	1.6	35	1	2.5%	
H62	631045	165700	1.6	35	1	3.7%	
H63	631091	165778	1.6	35	1	2.0%	
H64	631111	165805	1.6	35	1	3.8%	
H65	631115	165852	1.6	35	1	4.1%	
H66	631061	165470	1.6	35	1	2.0%	
H67	634597	166287	1.6	35	0	0.8%	
H68	635335	165657	1.6	35	1	2.1%	
H69	634417	165213	1.6	35	0	0.8%	
H70	631268	165516	1.6	35	1	2.5%	
S01	633172	166482	1.6	35	0	0.4%	
S02	633258	166471	1.6	35	0	0.4%	
S03	633351	166555	1.6	35	0	0.3%	
S04	634633	165956	1.6	35	0	0.8%	
S05	635743	166131	1.6	35	1	1.6%	
S06	636110	165647	1.6	35	0	0.4%	
S07	631121	165603	1.6	35	1	2.0%	
S08	631189	165670	1.6	35	1	2.0%	
A01	628199	169135	1.6	35	0	0.4%	
A02	629810	168213	1.6	35	0	0.9%	
A03	630337	168165	1.6	35	0	0.6%	
A04	631554	168915	1.6	35	0	1.3%	
A05	632410	169167	1.6	35	0	0.5%	
A06	633542	169294	1.6	35	0	0.7%	
A07	635052	169313	1.6	35	0	0.3%	
A08	635998	168591	1.6	35	0	0.9%	
A09	635909	167560	1.6	35	1	1.5%	
A10	635754	166743	1.6	35	1	1.6%	
A11	635574	165975	1.6	35	1	2.1%	
A12	635125	165203	1.6	35	1	2.1%	
A13	634752	165243	1.6	35	0	0.7%	
A14	634369	165285	1.6	35	0	0.9%	
A15	634356	165091	1.6	35	0	0.8%	
A16	634362	164473	1.6	35	0	0.7%	
A17	634276	164112	1.6	35	0	0.7%	
A18	634556	163810	1.6	35	0	0.4%	
A19	634834	164066	1.6	35	0	0.7%	
A20	635064	163939	1.6	35	0	0.6%	

Year 6. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedance	% PEC of A(	Impact
A21	635416	164358	1.6	35	0	0.8%	
A22	630226	169070	1.6	35	0	0.3%	
A23	630235	169089	1.6	35	0	0.3%	
A24	630253	169081	1.6	35	0	0.3%	
A25	630270	169076	1.6	35	0	0.3%	
A26	630288	169071	1.6	35	0	0.3%	
A27	630308	169071	1.6	35	0	0.3%	
A28	630308	169058	1.6	35	0	0.3%	
A29	630290	169050	1.6	35	0	0.3%	
A30	630276	169045	1.6	35	0	0.3%	
A31	630254	169033	1.6	35	0	0.3%	
A32	637052	165324	1.6	35	0	0.4%	
A33	637046	165372	1.6	35	0	0.4%	
A34	637074	165376	1.6	35	0	0.4%	
A35	637065	165340	1.6	35	0	0.4%	
A36	637075	165331	1.6	35	0	0.4%	
A37	637104	165345	1.6	35	0	0.4%	
A38	637140	165328	1.6	35	0	0.4%	
A39	637119	165323	1.6	35	0	0.4%	
A40	637099	165327	1.6	35	0	0.4%	
A41	637082	165319	1.6	35	0	0.4%	
A42	637085	165289	1.6	35	0	0.4%	
A43	637063	165280	1.6	35	0	0.4%	
M01	635931	165331	1.6	35	1	2.0%	
M02	638483	165430	1.6	35	0	0.3%	
M03	630284	169052	1.6	35	0	0.3%	
M04	639019	167981	1.6	35	0	0.3%	
M05	635539	169840	1.6	35	0	0.3%	
M06	630254	169037	1.6	35	0	0.3%	
M07	634445	164416	1.6	35	0	0.7%	
M08	638492	165410	1.6	35	0	0.3%	
M09	639097	165971	1.6	35	0	0.7%	
M10	634662	166026	1.6	35	0	0.8%	
M11	632984	166419	1.6	35	0	1.1%	
M12	631161	165486	1.6	35	1	2.0%	
M13	636570	167891	1.6	35	0	1.1%	
M14	636405	168227	1.6	35	1	1.5%	
M15	635932	165333	1.6	35	1	2.0%	
M16	630438	169111	1.6	35	0	0.3%	
M17	630186	168983	1.6	35	0	0.6%	
M18	638616	165564	1.6	35	0	0.3%	
M19	638472	165432	1.6	35	0	0.3%	
M20	637135	165354	1.6	35	0	0.4%	
M21	636815	167297	1.6	35	0	1.1%	
M22	638220	168614	1.6	35	0	0.4%	
M23	637112	165331	1.6	35	0	0.4%	
M24	638536	165465	1.6	35	0	0.3%	
M25	637092	165340	1.6	35	0	0.4%	
M26	638528	165426	1.6	35	0	0.3%	

Year 6. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedance	% PEC of A(	Impact
M27	634752	170679	1.6	35	0	0.4%	

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	25	0.04	12.93	0.2%	51.7%	Negligible
H02	631165	166314	1.6	25	0.03	12.75	0.1%	51.0%	Negligible
H03	631186	166424	1.6	25	0.03	12.75	0.1%	51.0%	Negligible
H04	631003	166651	1.6	25	0.02	12.74	0.1%	51.0%	Negligible
H05	630864	166832	1.6	25	0.02	11.52	0.1%	46.1%	Negligible
H06	632086	166298	1.6	25	0.16	11.29	0.6%	45.2%	Negligible
H07	632159	166430	1.6	25	0.12	11.25	0.5%	45.0%	Negligible
H08	632489	166193	1.6	25	0.14	11.85	0.6%	47.4%	Negligible
H09	632629	166210	1.6	25	0.19	12.13	0.7%	48.5%	Negligible
H10	633019	166385	1.6	25	0.27	11.30	1.1%	45.2%	Negligible
H11	633039	166403	1.6	25	0.27	11.16	1.1%	44.7%	Negligible
H12	633126	166502	1.6	25	0.21	10.90	0.8%	43.6%	Negligible
H13	633285	166619	1.6	25	0.16	10.72	0.6%	42.9%	Negligible
H14	633912	166981	1.6	25	0.08	10.77	0.3%	43.1%	Negligible
H15	634183	166374	1.6	25	0.17	11.40	0.7%	45.6%	Negligible
H16	634509	166374	1.6	25	0.13	11.36	0.5%	45.4%	Negligible
H17	634621	166241	1.6	25	0.18	11.91	0.7%	47.7%	Negligible
H18	634640	166153	1.6	25	0.16	11.81	0.7%	47.2%	Negligible
H19	634680	166079	1.6	25	0.15	11.30	0.6%	45.2%	Negligible
H20	634651	165954	1.6	25	0.16	11.19	0.7%	44.7%	Negligible
H21	634584	165938	1.6	25	0.20	11.15	0.8%	44.6%	Negligible
H22	634694	165880	1.6	25	0.15	11.10	0.6%	44.4%	Negligible
H23	634455	165807	1.6	25	0.30	11.26	1.2%	45.0%	Negligible
H24	635028	166030	1.6	25	0.10	12.25	0.4%	49.0%	Negligible
H25	635479	166321	1.6	25	0.04	11.55	0.2%	46.2%	Negligible
H26	635757	166282	1.6	25	0.03	11.54	0.1%	46.2%	Negligible
H27	636106	166044	1.6	25	0.03	10.87	0.1%	43.5%	Negligible
H28	636063	165787	1.6	25	0.03	11.39	0.1%	45.6%	Negligible
H29	635661	165661	1.6	25	0.04	11.64	0.1%	46.6%	Negligible
H30	635606	165627	1.6	25	0.04	11.64	0.2%	46.6%	Negligible
H31	635903	165323	1.6	25	0.03	11.63	0.1%	46.5%	Negligible
H32	635777	165134	1.6	25	0.04	12.39	0.1%	49.6%	Negligible
H33	634774	165056	1.6	25	0.08	11.03	0.3%	44.1%	Negligible
H34	634770	165249	1.6	25	0.10	11.05	0.4%	44.2%	Negligible
H35	634726	165251	1.6	25	0.11	11.06	0.4%	44.2%	Negligible
H36	634682	165251	1.6	25	0.11	11.06	0.5%	44.3%	Negligible
H37	634646	165253	1.6	25	0.12	11.07	0.5%	44.3%	Negligible
H38	634602	165260	1.6	25	0.13	11.08	0.5%	44.3%	Negligible
H39	634603	165217	1.6	25	0.12	11.07	0.5%	44.3%	Negligible
H40	634601	165182	1.6	25	0.12	11.07	0.5%	44.3%	Negligible
H41	634599	165138	1.6	25	0.11	11.06	0.4%	44.2%	Negligible
H42	634596	165101	1.6	25	0.10	11.05	0.4%	44.2%	Negligible
H43	634450	165100	1.6	25	0.12	11.07	0.5%	44.3%	Negligible
H44	634382	165134	1.6	25	0.13	11.08	0.5%	44.3%	Negligible
H45	634518	164793	1.6	25	0.06	11.27	0.3%	45.1%	Negligible
H46	633418	164980	1.6	25	0.04	11.35	0.2%	45.4%	Negligible
H47	633287	164842	1.6	25	0.03	11.34	0.1%	45.4%	Negligible
H48	633076	164912	1.6	25	0.04	11.34	0.2%	45.4%	Negligible
H49	632465	165443	1.6	25	0.06	11.68	0.3%	46.7%	Negligible
H50	632426	165384	1.6	25	0.06	11.55	0.2%	46.2%	Negligible
H51	632378	165324	1.6	25	0.05	11.37	0.2%	45.5%	Negligible

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H52	632242	165162	1.6	25	0.05	11.36	0.2%	45.4%	Negligible
H53	632166	165091	1.6	25	0.05	11.37	0.2%	45.5%	Negligible
H54	632064	165515	1.6	25	0.23	11.94	0.9%	47.8%	Negligible
H55	632023	165273	1.6	25	0.11	11.42	0.4%	45.7%	Negligible
H56	631079	165231	1.6	25	0.04	11.62	0.2%	46.5%	Negligible
H57	630849	165341	1.6	25	0.04	11.34	0.1%	45.4%	Negligible
H58	631238	165328	1.6	25	0.05	11.63	0.2%	46.5%	Negligible
H59	631258	165433	1.6	25	0.05	11.63	0.2%	46.5%	Negligible
H60	631203	165516	1.6	25	0.05	11.78	0.2%	47.1%	Negligible
H61	631139	165561	1.6	25	0.05	11.81	0.2%	47.2%	Negligible
H62	631045	165700	1.6	25	0.04	12.15	0.2%	48.6%	Negligible
H63	631091	165778	1.6	25	0.04	11.62	0.2%	46.5%	Negligible
H64	631111	165805	1.6	25	0.08	12.18	0.3%	48.7%	Negligible
H65	631115	165852	1.6	25	0.06	12.27	0.3%	49.1%	Negligible
H66	631061	165470	1.6	25	0.04	11.62	0.2%	46.5%	Negligible
H67	634597	166287	1.6	25	0.13	11.13	0.5%	44.5%	Negligible
H68	635335	165657	1.6	25	0.05	11.65	0.2%	46.6%	Negligible
H69	634417	165213	1.6	25	0.16	11.11	0.6%	44.5%	Negligible
H70	631268	165516	1.6	25	0.06	11.80	0.2%	47.2%	Negligible
A01	628199	169135	1.6	25	0.00	10.15	0.0%	40.6%	Negligible
A02	629810	168213	1.6	25	0.01	11.04	0.0%	44.2%	Negligible
A03	630337	168165	1.6	25	0.01	10.92	0.0%	43.7%	Negligible
A04	631554	168915	1.6	25	0.02	11.25	0.1%	45.0%	Negligible
A05	632410	169167	1.6	25	0.02	10.90	0.1%	43.6%	Negligible
A06	633542	169294	1.6	25	0.01	11.05	0.1%	44.2%	Negligible
A07	635052	169313	1.6	25	0.02	10.58	0.1%	42.3%	Negligible
A08	635998	168591	1.6	25	0.02	11.12	0.1%	44.5%	Negligible
A09	635909	167560	1.6	25	0.03	11.43	0.1%	45.7%	Negligible
A10	635754	166743	1.6	25	0.03	11.54	0.1%	46.2%	Negligible
A11	635574	165975	1.6	25	0.04	11.64	0.2%	46.6%	Negligible
A12	635125	165203	1.6	25	0.06	11.66	0.2%	46.6%	Negligible
A13	634752	165243	1.6	25	0.10	11.05	0.4%	44.2%	Negligible
A14	634369	165285	1.6	25	0.22	11.17	0.9%	44.7%	Negligible
A15	634356	165091	1.6	25	0.12	11.07	0.5%	44.3%	Negligible
A16	634362	164473	1.6	25	0.04	10.99	0.2%	43.9%	Negligible
A17	634276	164112	1.6	25	0.03	10.97	0.1%	43.9%	Negligible
A18	634556	163810	1.6	25	0.02	10.29	0.1%	41.2%	Negligible
A19	634834	164066	1.6	25	0.03	10.97	0.1%	43.9%	Negligible
A20	635064	163939	1.6	25	0.02	10.00	0.1%	40.0%	Negligible
A21	635416	164358	1.6	25	0.03	11.03	0.1%	44.1%	Negligible
A22	630226	169070	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A23	630235	169089	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A24	630253	169081	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A25	630270	169076	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A26	630288	169071	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A27	630308	169071	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A28	630308	169058	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A29	630290	169050	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A30	630276	169045	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A31	630254	169033	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
A32	637052	165324	1.6	25	0.02	10.88	0.1%	43.5%	Negligible

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A33	637046	165372	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A34	637074	165376	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A35	637065	165340	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A36	637075	165331	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A37	637104	165345	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A38	637140	165328	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A39	637119	165323	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A40	637099	165327	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A41	637082	165319	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A42	637085	165289	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
A43	637063	165280	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
M01	635931	165331	1.6	25	0.03	11.63	0.1%	46.5%	Negligible
M02	638483	165430	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M03	630284	169052	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
M04	639019	167981	1.6	25	0.01	10.62	0.0%	42.5%	Negligible
M05	635539	169840	1.6	25	0.01	10.57	0.1%	42.3%	Negligible
M06	630254	169037	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
M07	634445	164416	1.6	25	0.04	10.98	0.2%	43.9%	Negligible
M08	638492	165410	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M09	639097	165971	1.6	25	0.01	9.96	0.0%	39.8%	Negligible
M10	634662	166026	1.6	25	0.15	11.16	0.6%	44.6%	Negligible
M11	632984	166419	1.6	25	0.20	11.33	0.8%	45.3%	Negligible
M12	631161	165486	1.6	25	0.05	11.63	0.2%	46.5%	Negligible
M13	636570	167891	1.6	25	0.02	11.30	0.1%	45.2%	Negligible
M14	636405	168227	1.6	25	0.02	11.53	0.1%	46.1%	Negligible
M15	635932	165333	1.6	25	0.03	11.63	0.1%	46.5%	Negligible
M16	630438	169111	1.6	25	0.01	10.42	0.0%	41.7%	Negligible
M17	630186	168983	1.6	25	0.01	10.91	0.0%	43.7%	Negligible
M18	638616	165564	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M19	638472	165432	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M20	637135	165354	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
M21	636815	167297	1.6	25	0.02	11.30	0.1%	45.2%	Negligible
M22	638220	168614	1.6	25	0.01	10.77	0.0%	43.1%	Negligible
M23	637112	165331	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
M24	638536	165465	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M25	637092	165340	1.6	25	0.02	10.88	0.1%	43.5%	Negligible
M26	638528	165426	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M27	634752	170679	1.6	25	0.01	10.38	0.0%	41.5%	Negligible

Year 6. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
H01	631215	166224	1.6	3	0.07	0.07	2.4%	2.4%	
H02	631165	166314	1.6	3	0.07	0.07	2.2%	2.2%	
H03	631186	166424	1.6	3	0.06	0.06	1.9%	1.9%	
H04	631003	166651	1.6	3	0.04	0.04	1.4%	1.4%	
H05	630864	166832	1.6	3	0.03	0.03	1.1%	1.1%	
H06	632086	166298	1.6	3	0.22	0.22	7.3%	7.3%	
H07	632159	166430	1.6	3	0.18	0.18	6.0%	6.0%	
H08	632489	166193	1.6	3	0.22	0.22	7.4%	7.4%	
H09	632629	166210	1.6	3	0.22	0.22	7.4%	7.4%	
H10	633019	166385	1.6	3	0.33	0.33	10.8%	10.8%	
H11	633039	166403	1.6	3	0.34	0.34	11.3%	11.3%	
H12	633126	166502	1.6	3	0.34	0.34	11.4%	11.4%	
H13	633285	166619	1.6	3	0.37	0.37	12.2%	12.2%	
H14	633912	166981	1.6	3	0.23	0.23	7.5%	7.5%	
H15	634183	166374	1.6	3	0.29	0.29	9.7%	9.7%	
H16	634509	166374	1.6	3	0.18	0.18	5.9%	5.9%	
H17	634621	166241	1.6	3	0.18	0.18	6.1%	6.1%	
H18	634640	166153	1.6	3	0.18	0.18	5.9%	5.9%	
H19	634680	166079	1.6	3	0.17	0.17	5.8%	5.8%	
H20	634651	165954	1.6	3	0.18	0.18	5.9%	5.9%	
H21	634584	165938	1.6	3	0.19	0.19	6.4%	6.4%	
H22	634694	165880	1.6	3	0.17	0.17	5.8%	5.8%	
H23	634455	165807	1.6	3	0.25	0.25	8.3%	8.3%	
H24	635028	166030	1.6	3	0.13	0.13	4.2%	4.2%	
H25	635479	166321	1.6	3	0.08	0.08	2.7%	2.7%	
H26	635757	166282	1.6	3	0.07	0.07	2.2%	2.2%	
H27	636106	166044	1.6	3	0.06	0.06	1.9%	1.9%	
H28	636063	165787	1.6	3	0.06	0.06	2.1%	2.1%	
H29	635661	165661	1.6	3	0.08	0.08	2.5%	2.5%	
H30	635606	165627	1.6	3	0.08	0.08	2.8%	2.8%	
H31	635903	165323	1.6	3	0.07	0.07	2.2%	2.2%	
H32	635777	165134	1.6	3	0.07	0.07	2.3%	2.3%	
H33	634774	165056	1.6	3	0.12	0.12	4.0%	4.0%	
H34	634770	165249	1.6	3	0.17	0.17	5.6%	5.6%	
H35	634726	165251	1.6	3	0.17	0.17	5.8%	5.8%	
H36	634682	165251	1.6	3	0.17	0.17	5.8%	5.8%	
H37	634646	165253	1.6	3	0.18	0.18	5.9%	5.9%	
H38	634602	165260	1.6	3	0.18	0.18	5.9%	5.9%	
H39	634603	165217	1.6	3	0.16	0.16	5.4%	5.4%	
H40	634601	165182	1.6	3	0.16	0.16	5.3%	5.3%	
H41	634599	165138	1.6	3	0.15	0.15	5.0%	5.0%	
H42	634596	165101	1.6	3	0.14	0.14	4.7%	4.7%	
H43	634450	165100	1.6	3	0.15	0.15	4.9%	4.9%	
H44	634382	165134	1.6	3	0.15	0.15	5.1%	5.1%	
H45	634518	164793	1.6	3	0.10	0.10	3.3%	3.3%	
H46	633418	164980	1.6	3	0.16	0.16	5.4%	5.4%	
H47	633287	164842	1.6	3	0.13	0.13	4.2%	4.2%	
H48	633076	164912	1.6	3	0.16	0.16	5.4%	5.4%	
H49	632465	165443	1.6	3	0.25	0.25	8.5%	8.5%	

Year 6. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
H50	632426	165384	1.6	3	0.22	0.22	7.3%	7.3%	
H51	632378	165324	1.6	3	0.19	0.19	6.5%	6.5%	
H52	632242	165162	1.6	3	0.17	0.17	5.6%	5.6%	
H53	632166	165091	1.6	3	0.15	0.15	5.0%	5.0%	
H54	632064	165515	1.6	3	0.21	0.21	7.1%	7.1%	
H55	632023	165273	1.6	3	0.16	0.16	5.4%	5.4%	
H56	631079	165231	1.6	3	0.08	0.08	2.6%	2.6%	
H57	630849	165341	1.6	3	0.06	0.06	2.0%	2.0%	
H58	631238	165328	1.6	3	0.09	0.09	3.0%	3.0%	
H59	631258	165433	1.6	3	0.09	0.09	3.0%	3.0%	
H60	631203	165516	1.6	3	0.09	0.09	3.0%	3.0%	
H61	631139	165561	1.6	3	0.08	0.08	2.5%	2.5%	
H62	631045	165700	1.6	3	0.07	0.07	2.4%	2.4%	
H63	631091	165778	1.6	3	0.07	0.07	2.5%	2.5%	
H64	631111	165805	1.6	3	0.08	0.08	2.6%	2.6%	
H65	631115	165852	1.6	3	0.08	0.08	2.7%	2.7%	
H66	631061	165470	1.6	3	0.07	0.07	2.4%	2.4%	
H67	634597	166287	1.6	3	0.18	0.18	6.1%	6.1%	
H68	635335	165657	1.6	3	0.10	0.10	3.4%	3.4%	
H69	634417	165213	1.6	3	0.18	0.18	6.0%	6.0%	
H70	631268	165516	1.6	3	0.10	0.10	3.2%	3.2%	
S01	633172	166482	1.6	3	0.37	0.37	12.3%	12.3%	
S02	633258	166471	1.6	3	0.41	0.41	13.6%	13.6%	
S03	633351	166555	1.6	3	0.40	0.40	13.4%	13.4%	
S04	634633	165956	1.6	3	0.19	0.19	6.2%	6.2%	
S05	635743	166131	1.6	3	0.07	0.07	2.2%	2.2%	
S06	636110	165647	1.6	3	0.06	0.06	1.9%	1.9%	
S07	631121	165603	1.6	3	0.08	0.08	2.7%	2.7%	
S08	631189	165670	1.6	3	0.08	0.08	2.8%	2.8%	
A01	628199	169135	1.6	3	0.01	0.01	0.3%	0.3%	
A02	629810	168213	1.6	3	0.02	0.02	0.5%	0.5%	
A03	630337	168165	1.6	3	0.02	0.02	0.7%	0.7%	
A04	631554	168915	1.6	3	0.04	0.04	1.3%	1.3%	
A05	632410	169167	1.6	3	0.05	0.05	1.8%	1.8%	
A06	633542	169294	1.6	3	0.06	0.06	2.1%	2.1%	
A07	635052	169313	1.6	3	0.05	0.05	1.6%	1.6%	
A08	635998	168591	1.6	3	0.04	0.04	1.4%	1.4%	
A09	635909	167560	1.6	3	0.05	0.05	1.6%	1.6%	
A10	635754	166743	1.6	3	0.06	0.06	1.9%	1.9%	
A11	635574	165975	1.6	3	0.08	0.08	2.8%	2.8%	
A12	635125	165203	1.6	3	0.11	0.11	3.8%	3.8%	
A13	634752	165243	1.6	3	0.16	0.16	5.4%	5.4%	
A14	634369	165285	1.6	3	0.21	0.21	7.0%	7.0%	
A15	634356	165091	1.6	3	0.15	0.15	5.0%	5.0%	
A16	634362	164473	1.6	3	0.07	0.07	2.3%	2.3%	
A17	634276	164112	1.6	3	0.05	0.05	1.7%	1.7%	
A18	634556	163810	1.6	3	0.04	0.04	1.3%	1.3%	
A19	634834	164066	1.6	3	0.05	0.05	1.6%	1.6%	
A20	635064	163939	1.6	3	0.04	0.04	1.4%	1.4%	

Year 6. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
A21	635416	164358	1.6	3	0.05	0.05	1.7%	1.7%	
A22	630226	169070	1.6	3	0.02	0.02	0.6%	0.6%	
A23	630235	169089	1.6	3	0.02	0.02	0.6%	0.6%	
A24	630253	169081	1.6	3	0.02	0.02	0.6%	0.6%	
A25	630270	169076	1.6	3	0.02	0.02	0.6%	0.6%	
A26	630288	169071	1.6	3	0.02	0.02	0.6%	0.6%	
A27	630308	169071	1.6	3	0.02	0.02	0.6%	0.6%	
A28	630308	169058	1.6	3	0.02	0.02	0.6%	0.6%	
A29	630290	169050	1.6	3	0.02	0.02	0.6%	0.6%	
A30	630276	169045	1.6	3	0.02	0.02	0.6%	0.6%	
A31	630254	169033	1.6	3	0.02	0.02	0.6%	0.6%	
A32	637052	165324	1.6	3	0.03	0.03	1.2%	1.2%	
A33	637046	165372	1.6	3	0.04	0.04	1.2%	1.2%	
A34	637074	165376	1.6	3	0.03	0.03	1.1%	1.1%	
A35	637065	165340	1.6	3	0.03	0.03	1.1%	1.1%	
A36	637075	165331	1.6	3	0.03	0.03	1.1%	1.1%	
A37	637104	165345	1.6	3	0.03	0.03	1.1%	1.1%	
A38	637140	165328	1.6	3	0.03	0.03	1.1%	1.1%	
A39	637119	165323	1.6	3	0.03	0.03	1.1%	1.1%	
A40	637099	165327	1.6	3	0.03	0.03	1.1%	1.1%	
A41	637082	165319	1.6	3	0.03	0.03	1.1%	1.1%	
A42	637085	165289	1.6	3	0.04	0.04	1.2%	1.2%	
A43	637063	165280	1.6	3	0.04	0.04	1.3%	1.3%	
M01	635931	165331	1.6	3	0.07	0.07	2.2%	2.2%	
M02	638483	165430	1.6	3	0.02	0.02	0.7%	0.7%	
M03	630284	169052	1.6	3	0.02	0.02	0.6%	0.6%	
M04	639019	167981	1.6	3	0.02	0.02	0.5%	0.5%	
M05	635539	169840	1.6	3	0.04	0.04	1.4%	1.4%	
M06	630254	169037	1.6	3	0.02	0.02	0.6%	0.6%	
M07	634445	164416	1.6	3	0.06	0.06	2.1%	2.1%	
M08	638492	165410	1.6	3	0.02	0.02	0.7%	0.7%	
M09	639097	165971	1.6	3	0.02	0.02	0.7%	0.7%	
M10	634662	166026	1.6	3	0.18	0.18	6.1%	6.1%	
M11	632984	166419	1.6	3	0.28	0.28	9.4%	9.4%	
M12	631161	165486	1.6	3	0.09	0.09	2.9%	2.9%	
M13	636570	167891	1.6	3	0.03	0.03	1.1%	1.1%	
M14	636405	168227	1.6	3	0.04	0.04	1.2%	1.2%	
M15	635932	165333	1.6	3	0.07	0.07	2.2%	2.2%	
M16	630438	169111	1.6	3	0.02	0.02	0.7%	0.7%	
M17	630186	168983	1.6	3	0.02	0.02	0.6%	0.6%	
M18	638616	165564	1.6	3	0.02	0.02	0.7%	0.7%	
M19	638472	165432	1.6	3	0.02	0.02	0.7%	0.7%	
M20	637135	165354	1.6	3	0.03	0.03	1.1%	1.1%	
M21	636815	167297	1.6	3	0.03	0.03	1.1%	1.1%	
M22	638220	168614	1.6	3	0.02	0.02	0.7%	0.7%	
M23	637112	165331	1.6	3	0.03	0.03	1.1%	1.1%	
M24	638536	165465	1.6	3	0.02	0.02	0.8%	0.8%	
M25	637092	165340	1.6	3	0.03	0.03	1.1%	1.1%	
M26	638528	165426	1.6	3	0.02	0.02	0.7%	0.7%	

Year 6. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	3	0.03	0.03	1.1%	1.1%	

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical loa	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E01	621048	168683	0	8	0.00	12.60	0.0%	157.5%	Not significant
E02	625191	169137	0	8	0.01	12.75	0.1%	159.3%	Not significant
E03	628533	169560	0	8	0.01	12.75	0.1%	159.4%	Not significant
E04	629867	169917	0	8	0.02	12.76	0.2%	159.5%	Not significant
E05	630740	169804	0	8	0.02	13.04	0.3%	163.0%	Not significant
E06	631813	170059	0	8	0.03	10.39	0.4%	129.9%	Not significant
E07	632683	170381	0	8	0.03	10.39	0.3%	129.8%	Not significant
E08	633993	170521	0	8	0.03	10.39	0.4%	129.9%	Not significant
E09	635116	170740	0	8	0.03	10.81	0.3%	135.1%	Not significant
E10	636457	171381	0	8	0.02	10.80	0.3%	135.0%	Not significant
E11	637964	171321	0	8	0.02	10.80	0.2%	135.0%	Not significant
E12	639028	171113	0	8	0.02	10.80	0.2%	134.9%	Not significant
E13	639841	170161	0	8	0.01	10.79	0.2%	134.9%	Not significant
E14	639882	168631	0	8	0.01	13.17	0.2%	164.7%	Not significant
E15	639810	167452	0	8	0.01	13.17	0.2%	164.7%	Not significant
E16	639527	166684	0	8	0.01	13.17	0.2%	164.7%	Not significant
E17	639241	165688	0	8	0.02	13.18	0.2%	164.7%	Not significant
E18	638891	165003	0	Not sensitive	0.02	13.18	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	0.02	10.80	N/A	N/A	Not significant
E20	637303	164087	0	8	0.03	10.81	0.4%	135.2%	Not significant
E21	636318	164194	0	8	0.05	10.83	0.6%	135.3%	Not significant
E22	635298	164386	0	8	0.07	10.85	0.9%	135.7%	Not significant
E23	634800	164047	0	8	0.06	13.50	0.8%	168.8%	Not significant
E24	634346	163650	0	8	0.05	13.49	0.6%	168.6%	Not significant
E25	633796	162733	0	8	0.03	13.47	0.3%	168.3%	Not significant
E26	633703	162425	0	8	0.02	13.46	0.3%	168.3%	Not significant
E27	634513	161455	0	8	0.02	13.46	0.2%	168.2%	Not significant
E28	633502	161188	0	8	0.02	13.46	0.2%	168.2%	Not significant
E29	635337	160698	0	8	0.01	10.79	0.2%	134.9%	Not significant
E30	633692	159746	0	8	0.01	15.69	0.1%	196.1%	Not significant
E31	634794	159415	0	8	0.01	15.69	0.1%	196.1%	Not significant
E32	635708	159117	0	8	0.01	12.05	0.1%	150.6%	Not significant
E33	633607	158133	0	8	0.01	15.69	0.1%	196.1%	Not significant
E34	635539	157577	0	8	0.01	12.05	0.1%	150.6%	Not significant
E35	633584	156906	0	Not assessed	0.01	15.69	N/A	N/A	Not significant
E36	635214	156105	0	8	0.01	12.05	0.1%	150.6%	Not significant
E37	632347	155607	0	Not assessed	0.01	15.69	N/A	N/A	Not significant
E38	632033	163044	0	Not assessed	0.03	13.47	N/A	N/A	Not significant
E39	632554	162933	0	Not assessed	0.03	13.47	N/A	N/A	Not significant
E40	633412	162328	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E41	633527	162189	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E42	632364	162425	0	Not assessed	0.02	13.46	N/A	N/A	Not significant
E43	622112	162206	0	5	0.01	14.29	0.1%	285.7%	Not significant
E44	623126	162989	0	5	0.01	14.29	0.2%	285.8%	Not significant
E45	624052	162872	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E48	623648	161865	0	5	0.01	14.29	0.2%	285.8%	Not significant
E49	622879	161358	0	5	0.01	14.29	0.2%	285.8%	Not significant
E50	631694	164088	0	20	0.06	12.66	0.3%	63.3%	Not significant
E51	631458	164099	0	20	0.06	12.80	0.3%	64.0%	Not significant
E52	631039	164107	0	20	0.06	12.80	0.3%	64.0%	Not significant
E53	632436	162421	0	20	0.02	12.76	0.1%	63.8%	Not significant
E54	631908	162848	0	20	0.03	13.05	0.2%	65.3%	Not significant
E55	631008	162944	0	20	0.04	10.40	0.2%	52.0%	Not significant
E56	630479	164211	0	10	0.10	17.74	1.0%	177.4%	Not significant
E57	630389	164405	0	10	0.10	17.74	1.0%	177.4%	Not significant
E58	630172	164540	0	10	0.09	18.71	0.9%	187.1%	Not significant
E59	633116	169430	0	10	0.08	18.70	0.8%	187.0%	Not significant

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical loa	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E60	633976	168913	0	10	0.10	18.72	1.0%	187.2%	Not significant
E61	635881	166552	0	10	0.12	18.74	1.2%	187.4%	Not significant
E62	635634	165614	0	10	0.17	18.79	1.7%	187.9%	Not significant
E63	635696	165271	0	10	0.16	22.84	1.6%	228.4%	Not significant
E64	635212	165108	0	10	0.23	22.91	2.3%	229.1%	Not significant
E65	635302	164394	0	10	0.15	22.83	1.5%	228.3%	Not significant
E66	634825	164063	0	10	0.12	22.80	1.2%	228.0%	Not significant
E67	634369	163647	0	20	0.05	13.21	0.2%	66.0%	Not significant
E68	634218	163399	0	20	0.04	10.82	0.2%	54.1%	Not significant
E69	633122	163264	0	10	0.06	18.54	0.6%	185.4%	Not significant
E70	633581	165056	0	10	0.33	18.81	3.3%	188.1%	Not significant
E71	633420	165112	0	10	0.36	18.84	3.6%	188.4%	Not significant
E72	633441	164876	0	10	0.25	23.21	2.5%	232.1%	Not significant
E73	633330	164922	0	10	0.26	23.22	2.6%	232.2%	Not significant
E74	632062	164071	0	10	0.11	23.07	1.1%	230.7%	Not significant
E75	631267	164655	0	10	0.18	23.14	1.8%	231.4%	Not significant
E76	631135	164551	0	10	0.16	23.12	1.6%	231.2%	Not significant
E77	631149	166159	0	10	0.14	23.10	1.4%	231.0%	Not significant
E78	632034	166274	0	10	0.47	18.95	4.7%	189.5%	Not significant
E79	632106	166329	0	10	0.41	26.31	4.1%	263.1%	Not significant
E80	632102	166377	0	10	0.38	26.28	3.8%	262.8%	Not significant
E81	633049	166413	0	10	1.24	20.56	12.4%	205.6%	Not significant
E82	633119	166478	0	10	1.13	27.03	11.3%	270.3%	Not significant
E83	632891	166706	0	10	0.46	19.78	4.6%	197.8%	Not significant
E84	632763	166769	0	10	0.37	26.27	3.7%	262.7%	Not significant
E85	631105	168000	0	10	0.08	19.40	0.8%	194.0%	Not significant
E86	631260	168095	0	10	0.09	25.99	0.9%	259.9%	Not significant
E87	631603	168434	0	10	0.09	23.05	0.9%	230.5%	Not significant
E88	632016	168303	0	10	0.11	23.07	1.1%	230.7%	Not significant

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean acidity deposition rates.

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

Receptor n	X(m)	Y(m)	Z(m)	Acid Deposition (keq ha-1 y-1) CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC	Exceedance PC	Background	PEC	% of CL function PC	Backgroun	PEC	Impact
E01	621048	168683	0	0.88	0.223	1.13	0	0.0002	0.20	0.90	0.2	0.900245	No exceedance	No exceedance	No exceedance	0.0	97.3	97.4	Not significant
E02	625191	169137	0	0.88	0.223	1.13	0	0.0004	0.19	0.91	0.19	0.910382	No exceedance	No exceedance	No exceedance	0.0	97.3	97.4	Not significant
E03	628533	169560	0	0.88	0.223	1.13	0	0.0008	0.19	0.91	0.19	0.91082	No exceedance	No exceedance	No exceedance	0.1	97.3	97.4	Not significant
E04	629867	169917	0	0.88	0.223	1.13	0	0.0012	0.19	0.91	0.19	0.911208	No exceedance	No exceedance	No exceedance	0.1	97.3	97.5	Not significant
E05	630740	169804	0	0.88	0.223	1.13	0	0.0017	0.20	0.93	0.2	0.931674	No exceedance	No exceedance	0.00	0.1	100.0	100.1	Not significant
E06	631813	170059	0	0.88	0.223	1.13	0	0.0021	0.19	0.74	0.19	0.742131	No exceedance	No exceedance	No exceedance	0.2	82.3	82.5	Not significant
E07	632683	170381	0	0.88	0.223	1.13	0	0.0020	0.19	0.74	0.19	0.741976	No exceedance	No exceedance	No exceedance	0.2	82.3	82.5	Not significant
E08	633993	170521	0	0.88	0.223	1.13	0	0.0020	0.19	0.74	0.19	0.742033	No exceedance	No exceedance	No exceedance	0.2	82.3	82.5	Not significant
E09	635116	170740	0	0.88	0.223	1.13	0	0.0020	0.20	0.77	0.2	0.771974	No exceedance	No exceedance	No exceedance	0.2	85.8	86.0	Not significant
E10	636457	171381	0	0.88	0.223	1.13	0	0.0015	0.20	0.77	0.2	0.771516	No exceedance	No exceedance	No exceedance	0.1	85.8	86.0	Not significant
E11	637964	171321	0	0.88	0.223	1.13	0	0.0012	0.20	0.77	0.2	0.771248	No exceedance	No exceedance	No exceedance	0.1	85.8	86.0	Not significant
E12	639028	171113	0	0.88	0.223	1.13	0	0.0011	0.20	0.77	0.2	0.771076	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E13	639841	170161	0	0.88	0.223	1.13	0	0.0009	0.20	0.77	0.2	0.770925	No exceedance	No exceedance	No exceedance	0.1	85.8	85.9	Not significant
E14	639882	168631	0	0.88	0.223	1.13	0	0.0009	0.23	0.94	0.23	0.940888	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E15	639810	167452	0	0.88	0.223	1.13	0	0.0009	0.23	0.94	0.23	0.940937	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E16	639527	166684	0	0.88	0.223	1.13	0	0.0010	0.23	0.94	0.23	0.941044	No exceedance	0.04	0.04	0.1	103.5	103.6	Not significant
E17	639241	165688	0	0.88	0.223	1.13	0	0.0013	0.23	0.94	0.23	0.941268	No exceedance	0.04	0.04	0.1	103.5	103.7	Not significant
E18	638891	165003	0	Not sensitive	Not sensitive	Not sensitive	0	0.0015	0.23	0.94	0.23	0.941465	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	Not sensitive	Not sensitive	0	0.0016	0.21	0.77	0.21	0.771594	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E20	637303	164087	0	0.90	0.223	1.123	0	0.0023	0.21	0.77	0.21	0.772304	No exceedance	No exceedance	No exceedance	0.2	87.3	87.5	Not significant
E21	636318	164194	0	0.90	0.223	1.123	0	0.0034	0.21	0.77	0.21	0.773374	No exceedance	No exceedance	No exceedance	0.3	87.3	87.6	Not significant
E22	635298	164386	0	0.90	0.223	1.123	0	0.0052	0.21	0.77	0.21	0.775178	No exceedance	No exceedance	No exceedance	0.5	87.3	87.7	Not significant
E23	634800	164047	0	0.90	0.223	1.123	0	0.0043	0.20	0.96	0.2	0.964292	No exceedance	0.04	0.04	0.4	103.3	103.7	Not significant
E24	634346	163650	0	0.90	0.223	1.123	0	0.0033	0.20	0.96	0.2	0.963323	No exceedance	0.04	0.04	0.3	103.3	103.6	Not significant
E25	633796	162733	0	0.88	0.223	1.13	0	0.0019	0.20	0.96	0.2	0.961902	No exceedance	0.03	0.03	0.2	102.7	102.8	Not significant
E26	633703	162425	0	0.88	0.223	1.13	0	0.0017	0.20	0.96	0.2	0.961669	No exceedance	0.03	0.03	0.1	102.7	102.8	Not significant
E27	634513	161455	0	0.90	0.223	1.123	0	0.0013	0.20	0.96	0.2	0.961323	No exceedance	0.04	0.04	0.1	103.3	103.4	Not significant
E28	633502	161188	0	0.90	0.223	1.123	0	0.0011	0.20	0.96	0.2	0.9611	No exceedance	0.04	0.04	0.1	103.3	103.4	Not significant
E29	635337	160698	0	0.90	0.223	1.123	0	0.0010	0.21	0.77	0.21	0.771008	No exceedance	No exceedance	No exceedance	0.1	87.3	87.4	Not significant
E30	633692	159746	0	0.90	0.223	1.123	0	0.0008	0.25	1.12	0.25	1.120805	No exceedance	0.25	0.25	0.1	122.0	122.1	Not significant
E31	634794	159415	0	0.90	0.223	1.123	0	0.0008	0.25	1.12	0.25	1.120803	No exceedance	0.25	0.25	0.1	122.0	122.1	Not significant
E32	635708	159117	0	0.90	0.223	1.123	0	0.0007	0.23	0.86	0.23	0.860698	No exceedance	No exceedance	No exceedance	0.1	97.1	97.1	Not significant
E33	633607	158133	0	0.90	0.223	1.123	0	0.0006	0.25	1.12	0.25	1.120587	No exceedance	0.25	0.25	0.1	122.0	122.0	Not significant
E34	635539	157577	0	0.90	0.223	1.123	0	0.0006	0.23	0.86	0.23	0.860554	No exceedance	No exceedance	No exceedance	0.0	97.1	97.1	Not significant
E35	633584	156906	0	0.32	0.248	0.526	0	0.0005	0.25	1.12	0.25	1.120482	No exceedance	0.84	0.84	0.1	260.5	260.5	Not significant
E36	635214	156105	0	0.88	0.223	1.13	0	0.0005	0.23	0.86	0.23	0.860463	No exceedance	No exceedance	No exceedance	0.0	96.5	96.5	Not significant
E37	632347	155607	0	0.32	0.248	0.526	0	0.0004	0.25	1.12	0.25	1.120366	No exceedance	0.84	0.84	0.1	260.5	260.5	Not significant
E38	632033	163044	0	0.32	0.248	0.526	0	0.0023	0.20	0.96	0.2	0.962326	No exceedance	0.63	0.64	0.4	220.5	221.0	Not significant
E39	632554	162933	0	0.32	0.248	0.526	0	0.0020	0.20	0.96	0.2	0.962042	No exceedance	0.63	0.64	0.4	220.5	220.9	Not significant
E40	633412	162328	0	0.32	0.248	0.526	0	0.0016	0.20	0.96	0.2	0.961551	No exceedance	0.63	0.64	0.3	220.5	220.8	Not significant
E41	633527	162189	0	0.32	0.248	0.526	0	0.0015	0.20	0.96	0.2	0.961497	No exceedance	0.63	0.64	0.3	220.5	220.8	Not significant
E42	632364	162425	0	0.32	0.248	0.526	0	0.0017	0.20	0.96	0.2	0.961668	No exceedance	0.63	0.64	0.3	220.5	220.8	Not significant
E43	622112	162206	0	0.23	0.321	0.542	0	0.0005	0.22	1.02	0.22	1.020515	No exceedance	0.70	0.70	0.1	228.8	228.9	Not significant
E44	623126	162989	0	0.23	0.321	0.542	0	0.0006	0.22	1.02	0.22	1.020597	No exceedance	0.70	0.70	0.1	228.8	228.9	Not significant
E45	624052	162872	0	No critical load	No critical load	No critical load	0	0.0007	0.22	1.02	0.22	1.020679	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	No critical load	No critical load	0	0.0007	0.22	1.02	0.22	1.020682	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	No critical load	No critical load	0	0.0007	0.22	1.02	0.22	1.020658	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E48	623648	161865	0	0.23	0.321	0.542	0	0.0006	0.22	1.02	0.22	1.02062	No exceedance	0.70	0.70	0.1	228.8	228.9	Not significant
E49	622879	161358	0	0.23	0.321	0.542	0	0.0005	0.22	1.02	0.22	1.020549	No exceedance	0.70	0.70	0.1	228.8	228.9	Not significant
E50	631694	164088	0	3.93	0.85	4.79	0	0.0044	0.20	0.90	0.2	0.904396	No exceedance	No exceedance	No exceedance	0.1	23.0	23.1	Not significant
E51	631458	164099	0	3.93	0.85	4.79	0	0.0046	0.19	0.91	0.19	0.914587	No exceedance	No exceedance	No exceedance	0.1	23.0	23.1	Not significant
E52	631039	164107	0	3.93	0.85	4.79	0	0.0044	0.19	0.91	0.19	0.914359	No exceedance	No exceedance	No exceedance	0.1	23.0	23.1	Not significant
E53	632436	162421	0	3.93	0.85	4.79	0	0.0016	0.19	0.91	0.19	0.911646	No exceedance	No exceedance	No exceedance	0.0	23.0	23.0	Not significant
E54	631908	162848	0	3.93	0.85	4.79	0	0.0022	0.20	0.93	0.2	0.932171	No exceedance	No exceedance	No exceedance	0.0	23.6	23.6	Not significant
E55	631008	162944	0	3.93	0.85	4.79	0	0.0025	0.19	0.74	0.19	0.742524	No exceedance	No exceedance	No exceedance	0.0	4.8	4.8	Not significant
E56	630479	164211	0	1.77	0.14	1.91	0	0.0072	0.23	1.26	0.23	1.267224	No exceedance	No exceedance	No exceedance	0.4	78.0	78.4	Not significant
E57	630389	164405	0	1.77	0.14	1.91	0	0.0072	0.23	1.26	0.23	1.267239	No exceedance	No exceedance	No exceedance	0.4	78.0	78.4	Not significant
E58	630172	164540	0	1.77	0.14	1.91	0	0.0066	0.24	1.33	0.24	1.336621	No exceedance	No exceedance	No exceedance	0.3	82.2	82.5	Not significant
E59	633116	169430	0	1.67	0.14	1.81	0	0.0055	0.24	1.33	0.24	1.335482	No exceedance	No exceedance	No exceedance	0.3	86.7	87.0	Not significant
E60	633976	168913	0	10.81	0.14	10.96	0	0.0072	0.24	1.33	0.24	1.337187	No exceedance	No exceedance	No exceedance	0.1	14.3	14.4	Not significant
E61	635881	166552	0	1.68	0.14	1.82	0	0.0089	0.24	1.33	0.24	1.338855	No exceedance	No exceedance	No exceedance	0.5	86.3	86.8	Not significant
E62	635634	165614	0	10.83	0.14	10.97	0	0.0120	0.24	1.33	0.24	1.341964	No exceedance	No exceedance	No exceedance	0.1	14.3	14.4	Not significant
E63	635696	165271	0	10.83	0.14	10.97	0	0.0114	0.28	1.62	0.28	1.631449	No exceedance	No exceedance	No exceedance	0.1	17.3	17.4	Not significant
E64	635212	165108	0	10.83	0.14	10.97	0	0.0168	0.28	1.62	0.28	1.636785	No exceedance	No exceedance	No exceedance	0.2	17.3	17.5	Not significant
E65	635302	164394	0	1.72	0.14	1.86	0	0.0104	0.28	1.62	0.28	1.63041	No exceedance	0.04	0.05	0.6	102.2	102.7	Not significant
E66	634825	164063	0	1.77	0.14	1.91	0	0.0086	0.28	1.62	0.28	1.628636	No exceedance	No exceedance	No exceedance	0.5	99.5	99.9	Not significant
E67	634369	163647	0	3.93	0.85	4.79	0	0.0033	0.23	0.94	0.23	0.94333	No exceedance	No exceedance	No exceedance	0.1	24.4	24.5	Not significant
E68	634218	163399	0	3.93	0.85	4.79	0	0.0028	0.21	0.77	0.21	0.772781	No exceedance	No exceedance	No exceedance	0.0	5.3	5.3	Not significant
E69	633122	163264	0	1.77	0.14	1.92	0	0.0046	0.26	1.32	0.26	1.324632	No exceedance	No exceedance	No exceedance	0.2	82.3	82.5	Not significant
E70	633581	165056	0	10.83	0.14	10.97	0	0.0238	0.26	1.32	0.26	1.343809	No exceedance	No exceedance	No exceedance	0.2	14.4	14.6	Not significant
E71	633420	165112	0	10.83	0.14	10.97	0	0.0256	0.26	1.32	0.26	1.345577	No exceedance	No exceedance	No exceedance	0.2	14.4	14.6	Not significant
E72	633441	164876	0	1.77	0.14	1.92	0	0.0176	0.24	1.64	0.24	1.65763	No exceedance	No exceedance	No exceedance	0.9	97.9	98.8	Not significant
E73	633330	164922	0	1.77	0.14	1.92	0	0.0189	0.24	1.64	0.24	1.65887	No exceedance	No exceedance	No exceedance	1.0	97.9	98.9	Not significant
E74	632062	164071	0	1.77	0.14	1.92	0	0.0080	0.24	1.64	0.24	1.648024	No exceedance	No exceedance	No exceedance	0.4	97.9	98.3	Not significant
E75	631267	164655	0	1.77	0.14	1.91	0	0.0125	0.24	1.64	0.24	1.652518	No exceedance	No exceedance	No exceedance	0.7	98.4	99.1	Not significant

Year 6. Concentrations from airport operation, construction (Stage IV plant) and road traffic.
Annual mean acidity deposition rates.

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

				Acid Deposition (keq ha-1 y-1)								
Receptor n	X(m)	Y(m)	Z(m)	CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC
E76	631135	164551	0	1.77	0.14	1.91	0	0.0111	0.24	1.64	0.24	1.65112
E77	631149	166159	0	1.68	0.14	1.82	0	0.0100	0.24	1.64	0.24	1.649968
E78	632034	166274	0	10.82	0.14	10.97	0	0.0337	0.26	1.32	0.26	1.353737
E79	632106	166329	0	10.82	0.14	10.97	0	0.0293	0.29	1.85	0.29	1.879285
E80	632102	166377	0	10.82	0.14	10.97	0	0.0270	0.29	1.85	0.29	1.87704
E81	633049	166413	0	10.82	0.14	10.97	0	0.0882	0.27	1.38	0.27	1.468227
E82	633119	166478	0	10.82	0.14	10.97	0	0.0807	0.29	1.85	0.29	1.930696
E83	632891	166706	0	10.82	0.14	10.97	0	0.0326	0.27	1.38	0.27	1.412596
E84	632763	166769	0	10.82	0.14	10.97	0	0.0261	0.29	1.85	0.29	1.876086
E85	631105	168000	0	1.67	0.14	1.81	0	0.0058	0.27	1.38	0.27	1.385829
E86	631260	168095	0	1.67	0.14	1.81	0	0.0062	0.29	1.85	0.29	1.856158
E87	631603	168434	0	1.67	0.14	1.81	0	0.0065	0.24	1.64	0.24	1.646481
E88	632016	168303	0	1.67	0.14	1.81	0	0.0077	0.24	1.64	0.24	1.647679

Receptor n	Exceedance			% of CL function			
	PC	Background	PEC	PC	Backgroun	PEC	Impact
E76	No exceedance	No exceedance	No exceedance	0.6	98.4	99.0	Not significant
E77	No exceedance	0.06	0.07	0.5	103.3	103.8	Not significant
E78	No exceedance	No exceedance	No exceedance	0.3	14.4	14.7	Not significant
E79	No exceedance	No exceedance	No exceedance	0.3	19.5	19.8	Not significant
E80	No exceedance	No exceedance	No exceedance	0.2	19.5	19.8	Not significant
E81	No exceedance	No exceedance	No exceedance	0.8	15.0	15.8	Not significant
E82	No exceedance	No exceedance	No exceedance	0.7	19.5	20.2	Not significant
E83	No exceedance	No exceedance	No exceedance	0.3	15.0	15.3	Not significant
E84	No exceedance	No exceedance	No exceedance	0.2	19.5	19.7	Not significant
E85	No exceedance	No exceedance	No exceedance	0.3	91.2	91.5	Not significant
E86	No exceedance	0.33	0.34	0.3	118.2	118.6	Not significant
E87	No exceedance	0.07	0.08	0.4	103.9	104.2	Not significant
E88	No exceedance	0.07	0.08	0.4	103.9	104.3	Not significant

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m·	% PC of AC	% PEC of A	Impact
E01	621048	168683	0	30	0.21	29.64	0.7%	98.8%	Not significant
E02	625191	169137	0	30	0.07	25.97	0.2%	86.6%	Not significant
E03	628533	169560	0	30	0.15	26.05	0.5%	86.8%	Not significant
E04	629867	169917	0	30	0.23	26.13	0.8%	87.1%	Not significant
E05	630740	169804	0	30	0.32	26.22	1.1%	87.4%	Further assessment required
E06	631813	170059	0	30	0.40	26.30	1.3%	87.7%	Further assessment required
E07	632683	170381	0	30	0.36	26.26	1.2%	87.5%	Further assessment required
E08	633993	170521	0	30	1.51	39.70	5.0%	132.3%	Further assessment required
E09	635116	170740	0	30	2.02	44.95	6.7%	149.8%	Further assessment required
E10	636457	171381	0	30	0.67	38.71	2.2%	129.0%	Further assessment required
E11	637964	171321	0	30	0.76	35.95	2.5%	119.8%	Further assessment required
E12	639028	171113	0	30	0.42	31.35	1.4%	104.5%	Further assessment required
E13	639841	170161	0	30	0.27	28.25	0.9%	94.2%	Not significant
E14	639882	168631	0	30	0.34	30.89	1.1%	103.0%	Further assessment required
E15	639810	167452	0	30	0.64	31.46	2.1%	104.9%	Further assessment required
E16	639527	166684	0	30	0.22	30.73	0.7%	102.4%	Not significant
E17	639241	165688	0	30	1.42	42.06	4.7%	140.2%	Further assessment required
E18	638891	165003	0	30	0.79	39.75	2.6%	132.5%	Further assessment required
E19	638595	164294	0	30	0.49	29.32	1.6%	97.7%	Further assessment required
E20	637303	164087	0	30	0.43	27.79	1.4%	92.6%	Further assessment required
E21	636318	164194	0	30	0.60	26.50	2.0%	88.3%	Further assessment required
E22	635298	164386	0	30	0.93	26.83	3.1%	89.4%	Further assessment required
E23	634800	164047	0	30	0.80	26.70	2.7%	89.0%	Further assessment required
E24	634346	163650	0	30	1.15	40.12	3.8%	133.7%	Further assessment required
E25	633796	162733	0	30	0.34	26.24	1.1%	87.5%	Further assessment required
E26	633703	162425	0	30	0.30	26.20	1.0%	87.3%	Not significant
E27	634513	161455	0	30	0.25	26.15	0.8%	87.2%	Not significant
E28	633502	161188	0	30	0.33	36.33	1.1%	121.1%	Further assessment required
E29	635337	160698	0	30	0.19	26.09	0.6%	87.0%	Not significant
E30	633692	159746	0	30	0.15	26.05	0.5%	86.8%	Not significant
E31	634794	159415	0	30	0.16	26.06	0.5%	86.9%	Not significant
E32	635708	159117	0	30	0.22	40.15	0.7%	133.8%	Not significant
E33	633607	158133	0	30	0.11	26.01	0.4%	86.7%	Not significant
E34	635539	157577	0	30	0.11	26.01	0.4%	86.7%	Not significant
E35	633584	156906	0	30	0.09	25.99	0.3%	86.6%	Not significant
E36	635214	156105	0	30	0.09	25.99	0.3%	86.6%	Not significant
E37	632347	155607	0	30	0.07	25.97	0.2%	86.6%	Not significant
E38	632033	163044	0	30	0.42	26.32	1.4%	87.7%	Further assessment required
E39	632554	162933	0	30	0.36	26.26	1.2%	87.5%	Further assessment required
E40	633412	162328	0	30	0.27	26.17	0.9%	87.2%	Not significant
E41	633527	162189	0	30	0.27	26.17	0.9%	87.2%	Not significant
E42	632364	162425	0	30	0.30	26.20	1.0%	87.3%	Not significant
E43	622112	162206	0	30	0.10	26.00	0.3%	86.7%	Not significant
E44	623126	162989	0	30	0.12	26.02	0.4%	86.7%	Not significant
E45	624052	162872	0	30	0.16	31.04	0.5%	103.5%	Not significant
E46	624096	162621	0	30	0.13	26.03	0.4%	86.8%	Not significant
E47	623938	162268	0	30	0.13	26.03	0.4%	86.8%	Not significant
E48	623648	161865	0	30	0.12	26.02	0.4%	86.7%	Not significant
E49	622879	161358	0	30	0.12	33.11	0.4%	110.4%	Not significant
E50	631694	164088	0	30	0.83	30.96	2.8%	103.2%	Not significant
E51	631458	164099	0	30	0.86	26.76	2.9%	89.2%	Not significant
E52	631039	164107	0	30	0.82	26.72	2.7%	89.1%	Not significant
E53	632436	162421	0	30	0.29	26.19	1.0%	87.3%	Not significant
E54	631908	162848	0	30	0.41	35.67	1.4%	118.9%	Not significant
E55	631008	162944	0	30	0.49	26.39	1.6%	88.0%	Not significant
E56	630479	164211	0	30	0.68	26.58	2.3%	88.6%	Not significant
E57	630389	164405	0	30	0.69	26.59	2.3%	88.6%	Not significant
E58	630172	164540	0	30	0.64	26.54	2.1%	88.5%	Not significant
E59	633116	169430	0	30	0.47	26.37	1.6%	87.9%	Not significant
E60	633976	168913	0	30	0.62	30.01	2.1%	100.0%	Not significant
E61	635881	166552	0	30	0.82	31.02	2.7%	103.4%	Not significant
E62	635634	165614	0	30	1.05	39.56	3.5%	131.9%	Not significant
E63	635696	165271	0	30	1.03	26.93	3.4%	89.8%	Not significant

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg r	PC (µg m−:	PEC (µg m·	% PC of AC	% PEC of A	Impact
E64	635212	165108	0	30	2.55	39.49	8.5%	131.6%	Not significant
E65	635302	164394	0	30	1.56	40.85	5.2%	136.2%	Not significant
E66	634825	164063	0	30	0.80	26.70	2.7%	89.0%	Not significant
E67	634369	163647	0	30	0.63	26.53	2.1%	88.4%	Not significant
E68	634218	163399	0	30	0.52	26.42	1.7%	88.1%	Not significant
E69	633122	163264	0	30	0.40	26.30	1.3%	87.7%	Not significant
E70	633581	165056	0	30	2.08	31.91	6.9%	106.4%	Not significant
E71	633420	165112	0	30	2.24	28.14	7.5%	93.8%	Not significant
E72	633441	164876	0	30	1.55	27.45	5.2%	91.5%	Not significant
E73	633330	164922	0	30	1.65	27.55	5.5%	91.8%	Not significant
E74	632062	164071	0	30	0.73	26.63	2.4%	88.8%	Not significant
E75	631267	164655	0	30	1.19	27.09	4.0%	90.3%	Not significant
E76	631135	164551	0	30	1.05	26.95	3.5%	89.8%	Not significant
E77	631149	166159	0	30	0.96	26.86	3.2%	89.5%	Not significant
E78	632034	166274	0	30	3.37	29.27	11.2%	97.6%	Not significant
E79	632106	166329	0	30	2.82	28.72	9.4%	95.7%	Not significant
E80	632102	166377	0	30	2.58	28.48	8.6%	94.9%	Not significant
E81	633049	166413	0	30	3.61	29.51	12.0%	98.4%	Not significant
E82	633119	166478	0	30	3.48	29.38	11.6%	97.9%	Not significant
E83	632891	166706	0	30	2.09	27.99	7.0%	93.3%	Not significant
E84	632763	166769	0	30	1.83	27.73	6.1%	92.4%	Not significant
E85	631105	168000	0	30	0.54	26.44	1.8%	88.1%	Not significant
E86	631260	168095	0	30	0.58	26.48	1.9%	88.3%	Not significant
E87	631603	168434	0	30	0.61	26.51	2.0%	88.4%	Not significant
E88	632016	168303	0	30	0.70	26.60	2.3%	88.7%	Not significant
M01	635931	165331	1.6	30	0.87	26.77	2.9%	89.2%	
M02	638483	165430	1.6	30	0.29	26.19	1.0%	87.3%	
M03	630284	169052	1.6	30	0.30	26.20	1.0%	87.3%	
M04	639019	167981	1.6	30	0.21	26.11	0.7%	87.0%	
M05	635539	169840	1.6	30	0.46	26.36	1.5%	87.9%	
M06	630254	169037	1.6	30	0.29	26.19	1.0%	87.3%	
M07	634445	164416	1.6	30	1.17	27.07	3.9%	90.2%	
M08	638492	165410	1.6	30	0.29	26.19	1.0%	87.3%	
M09	639097	165971	1.6	30	0.22	26.12	0.7%	87.1%	
M10	634662	166026	1.6	30	3.75	29.65	12.5%	98.8%	
M11	632984	166419	1.6	30	3.26	29.16	10.9%	97.2%	
M12	631161	165486	1.6	30	1.52	27.42	5.1%	91.4%	
M13	636570	167891	1.6	30	0.53	26.43	1.8%	88.1%	
M14	636405	168227	1.6	30	0.55	26.45	1.8%	88.2%	
M15	635932	165333	1.6	30	0.87	26.77	2.9%	89.2%	
M16	630438	169111	1.6	30	0.31	26.21	1.0%	87.4%	
M17	630186	168983	1.6	30	0.28	26.18	0.9%	87.3%	
M18	638616	165564	1.6	30	0.27	26.17	0.9%	87.2%	
M19	638472	165432	1.6	30	0.29	26.19	1.0%	87.3%	
M20	637135	165354	1.6	30	0.46	26.36	1.5%	87.9%	
M21	636815	167297	1.6	30	0.46	26.36	1.5%	87.9%	
M22	638220	168614	1.6	30	0.27	26.17	0.9%	87.2%	
M23	637112	165331	1.6	30	0.47	26.37	1.6%	87.9%	
M24	638536	165465	1.6	30	0.28	26.18	0.9%	87.3%	
M25	637092	165340	1.6	30	0.47	26.37	1.6%	87.9%	
M26	638528	165426	1.6	30	0.28	26.18	0.9%	87.3%	

Year 20. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E01	621048	168683	0	200	1.05	52.85	0.5%	26.4%	Not significant
E02	625191	169137	0	200	2.10	53.90	1.1%	27.0%	Not significant
E03	628533	169560	0	200	3.09	54.89	1.5%	27.4%	Not significant
E04	629867	169917	0	200	3.87	55.67	1.9%	27.8%	Not significant
E05	630740	169804	0	200	4.63	56.43	2.3%	28.2%	Not significant
E06	631813	170059	0	200	6.78	58.58	3.4%	29.3%	Not significant
E07	632683	170381	0	200	5.20	57.00	2.6%	28.5%	Not significant
E08	633993	170521	0	200	6.32	58.12	3.2%	29.1%	Not significant
E09	635116	170740	0	200	5.33	57.13	2.7%	28.6%	Not significant
E10	636457	171381	0	200	3.85	55.65	1.9%	27.8%	Not significant
E11	637964	171321	0	200	3.02	54.82	1.5%	27.4%	Not significant
E12	639028	171113	0	200	2.58	54.38	1.3%	27.2%	Not significant
E13	639841	170161	0	200	2.18	53.98	1.1%	27.0%	Not significant
E14	639882	168631	0	200	3.33	55.13	1.7%	27.6%	Not significant
E15	639810	167452	0	200	5.04	56.84	2.5%	28.4%	Not significant
E16	639527	166684	0	200	5.80	57.60	2.9%	28.8%	Not significant
E17	639241	165688	0	200	6.34	58.14	3.2%	29.1%	Not significant
E18	638891	165003	0	200	7.47	59.27	3.7%	29.6%	Not significant
E19	638595	164294	0	200	7.95	59.75	4.0%	29.9%	Not significant
E20	637303	164087	0	200	9.91	61.71	5.0%	30.9%	Not significant
E21	636318	164194	0	200	13.31	65.11	6.7%	32.6%	Not significant
E22	635298	164386	0	200	20.04	71.84	10.0%	35.9%	Not significant
E23	634800	164047	0	200	11.46	63.26	5.7%	31.6%	Not significant
E24	634346	163650	0	200	12.58	64.38	6.3%	32.2%	Not significant
E25	633796	162733	0	200	9.29	61.09	4.6%	30.5%	Not significant
E26	633703	162425	0	200	8.41	60.21	4.2%	30.1%	Not significant
E27	634513	161455	0	200	8.02	59.82	4.0%	29.9%	Not significant
E28	633502	161188	0	200	5.86	57.66	2.9%	28.8%	Not significant
E29	635337	160698	0	200	6.00	57.80	3.0%	28.9%	Not significant
E30	633692	159746	0	200	4.74	56.54	2.4%	28.3%	Not significant
E31	634794	159415	0	200	5.46	57.26	2.7%	28.6%	Not significant
E32	635708	159117	0	200	4.65	56.45	2.3%	28.2%	Not significant
E33	633607	158133	0	200	3.47	55.27	1.7%	27.6%	Not significant
E34	635539	157577	0	200	4.01	55.81	2.0%	27.9%	Not significant
E35	633584	156906	0	200	2.86	54.66	1.4%	27.3%	Not significant
E36	635214	156105	0	200	3.27	55.07	1.6%	27.5%	Not significant
E37	632347	155607	0	200	1.73	53.53	0.9%	26.8%	Not significant
E38	632033	163044	0	200	7.60	59.40	3.8%	29.7%	Not significant
E39	632554	162933	0	200	6.30	58.10	3.2%	29.1%	Not significant
E40	633412	162328	0	200	7.24	59.04	3.6%	29.5%	Not significant
E41	633527	162189	0	200	7.41	59.21	3.7%	29.6%	Not significant
E42	632364	162425	0	200	5.59	57.39	2.8%	28.7%	Not significant
E43	622112	162206	0	200	3.53	55.33	1.8%	27.7%	Not significant
E44	623126	162989	0	200	3.68	55.48	1.8%	27.7%	Not significant
E45	624052	162872	0	200	4.67	56.47	2.3%	28.2%	Not significant
E46	624096	162621	0	200	4.82	56.62	2.4%	28.3%	Not significant
E47	623938	162268	0	200	4.69	56.49	2.3%	28.2%	Not significant
E48	623648	161865	0	200	4.37	56.17	2.2%	28.1%	Not significant
E49	622879	161358	0	200	3.82	55.62	1.9%	27.8%	Not significant
E50	631694	164088	0	200	13.81	65.61	6.9%	32.8%	Not significant
E51	631458	164099	0	200	14.49	66.29	7.2%	33.1%	Not significant
E52	631039	164107	0	200	15.32	67.12	7.7%	33.6%	Not significant
E53	632436	162421	0	200	5.49	57.29	2.7%	28.6%	Not significant
E54	631908	162848	0	200	7.26	59.06	3.6%	29.5%	Not significant

Year 20. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
E55	631008	162944	0	200	9.88	61.68	4.9%	30.8%	Not significant
E56	630479	164211	0	200	19.50	71.30	9.7%	35.6%	Not significant
E57	630389	164405	0	200	20.79	72.59	10.4%	36.3%	Not significant
E58	630172	164540	0	200	19.46	71.26	9.7%	35.6%	Not significant
E59	633116	169430	0	200	6.40	58.20	3.2%	29.1%	Not significant
E60	633976	168913	0	200	9.06	60.86	4.5%	30.4%	Not significant
E61	635881	166552	0	200	10.52	62.32	5.3%	31.2%	Not significant
E62	635634	165614	0	200	23.08	74.88	11.5%	37.4%	Not significant
E63	635696	165271	0	200	24.80	76.60	12.4%	38.3%	Not significant
E64	635212	165108	0	200	27.89	79.69	13.9%	39.8%	Not significant
E65	635302	164394	0	200	20.22	72.02	10.1%	36.0%	Not significant
E66	634825	164063	0	200	11.73	63.53	5.9%	31.8%	Not significant
E67	634369	163647	0	200	12.54	64.34	6.3%	32.2%	Not significant
E68	634218	163399	0	200	11.85	63.65	5.9%	31.8%	Not significant
E69	633122	163264	0	200	7.88	59.68	3.9%	29.8%	Not significant
E70	633581	165056	0	200	15.34	67.14	7.7%	33.6%	Not significant
E71	633420	165112	0	200	17.51	69.31	8.8%	34.7%	Not significant
E72	633441	164876	0	200	13.66	65.46	6.8%	32.7%	Not significant
E73	633330	164922	0	200	15.15	66.95	7.6%	33.5%	Not significant
E74	632062	164071	0	200	12.18	63.98	6.1%	32.0%	Not significant
E75	631267	164655	0	200	21.56	73.36	10.8%	36.7%	Not significant
E76	631135	164551	0	200	21.11	72.91	10.6%	36.5%	Not significant
E77	631149	166159	0	200	13.57	65.37	6.8%	32.7%	Not significant
E78	632034	166274	0	200	19.65	71.45	9.8%	35.7%	Not significant
E79	632106	166329	0	200	16.33	68.13	8.2%	34.1%	Not significant
E80	632102	166377	0	200	15.52	67.32	7.8%	33.7%	Not significant
E81	633049	166413	0	200	16.74	68.54	8.4%	34.3%	Not significant
E82	633119	166478	0	200	16.60	68.40	8.3%	34.2%	Not significant
E83	632891	166706	0	200	11.90	63.70	5.9%	31.8%	Not significant
E84	632763	166769	0	200	11.23	63.03	5.6%	31.5%	Not significant
E85	631105	168000	0	200	7.51	59.31	3.8%	29.7%	Not significant
E86	631260	168095	0	200	8.11	59.91	4.1%	30.0%	Not significant
E87	631603	168434	0	200	8.32	60.12	4.2%	30.1%	Not significant
E88	632016	168303	0	200	9.50	61.30	4.8%	30.7%	Not significant
M01	635931	165331	1.6	200	22.60	74.40	11.3%	37.2%	
M02	638483	165430	1.6	200	8.40	60.20	4.2%	30.1%	
M03	630284	169052	1.6	200	4.88	56.68	2.4%	28.3%	
M04	639019	167981	1.6	200	4.42	56.22	2.2%	28.1%	
M05	635539	169840	1.6	200	5.33	57.13	2.7%	28.6%	
M06	630254	169037	1.6	200	4.84	56.64	2.4%	28.3%	
M07	634445	164416	1.6	200	14.59	66.39	7.3%	33.2%	
M08	638492	165410	1.6	200	8.41	60.21	4.2%	30.1%	
M09	639097	165971	1.6	200	5.58	57.38	2.8%	28.7%	
M10	634662	166026	1.6	200	16.65	68.45	8.3%	34.2%	
M11	632984	166419	1.6	200	15.64	67.44	7.8%	33.7%	
M12	631161	165486	1.6	200	37.78	89.58	18.9%	44.8%	
M13	636570	167891	1.6	200	4.97	56.77	2.5%	28.4%	
M14	636405	168227	1.6	200	4.96	56.76	2.5%	28.4%	
M15	635932	165333	1.6	200	22.60	74.40	11.3%	37.2%	
M16	630438	169111	1.6	200	5.01	56.81	2.5%	28.4%	
M17	630186	168983	1.6	200	4.73	56.53	2.4%	28.3%	
M18	638616	165564	1.6	200	7.80	59.60	3.9%	29.8%	
M19	638472	165432	1.6	200	8.42	60.22	4.2%	30.1%	
M20	637135	165354	1.6	200	13.16	64.96	6.6%	32.5%	

Year 20. Concentrations from airport operation.
Maximum daily-mean NOx concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m-	% PC of AQ	% PEC of A	Impact
M21	636815	167297	1.6	200	5.99	57.79	3.0%	28.9%	
M22	638220	168614	1.6	200	3.44	55.24	1.7%	27.6%	
M23	637112	165331	1.6	200	13.28	65.08	6.6%	32.5%	
M24	638536	165465	1.6	200	8.21	60.01	4.1%	30.0%	
M25	637092	165340	1.6	200	13.38	65.18	6.7%	32.6%	
M26	638528	165426	1.6	200	8.30	60.10	4.2%	30.1%	

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	40	0.78	21.97	1.9%	54.9%	Negligible
H02	631165	166314	1.6	40	0.61	19.91	1.5%	49.8%	Negligible
H03	631186	166424	1.6	40	0.60	19.90	1.5%	49.8%	Negligible
H04	631003	166651	1.6	40	0.45	19.75	1.1%	49.4%	Negligible
H05	630864	166832	1.6	40	0.38	19.68	1.0%	49.2%	Negligible
H06	632086	166298	1.6	40	2.13	21.43	5.3%	53.6%	Negligible
H07	632159	166430	1.6	40	1.58	20.88	4.0%	52.2%	Negligible
H08	632489	166193	1.6	40	3.11	28.87	7.8%	72.2%	Slight
H09	632629	166210	1.6	40	3.35	31.49	8.4%	78.7%	Moderate
H10	633019	166385	1.6	40	2.73	28.41	6.8%	71.0%	Slight
H11	633039	166403	1.6	40	2.79	27.01	7.0%	67.5%	Slight
H12	633126	166502	1.6	40	2.44	24.44	6.1%	61.1%	Slight
H13	633285	166619	1.6	40	2.21	22.63	5.5%	56.6%	Slight
H14	633912	166981	1.6	40	1.56	23.35	3.9%	58.4%	Negligible
H15	634183	166374	1.6	40	2.62	24.56	6.6%	61.4%	Slight
H16	634509	166374	1.6	40	2.03	23.80	5.1%	59.5%	Negligible
H17	634621	166241	1.6	40	2.75	29.75	6.9%	74.4%	Slight
H18	634640	166153	1.6	40	2.59	28.74	6.5%	71.9%	Slight
H19	634680	166079	1.6	40	2.52	23.39	6.3%	58.5%	Slight
H20	634651	165954	1.6	40	2.93	23.02	7.3%	57.5%	Slight
H21	634584	165938	1.6	40	3.32	22.62	8.3%	56.5%	Slight
H22	634694	165880	1.6	40	2.98	22.28	7.5%	55.7%	Slight
H23	634455	165807	1.6	40	4.94	24.24	12.4%	60.6%	Moderate
H24	635028	166030	1.6	40	1.74	27.89	4.3%	69.7%	Negligible
H25	635479	166321	1.6	40	0.80	20.10	2.0%	50.3%	Negligible
H26	635757	166282	1.6	40	0.62	19.92	1.6%	49.8%	Negligible
H27	636106	166044	1.6	40	0.48	19.78	1.2%	49.5%	Negligible
H28	636063	165787	1.6	40	0.58	25.20	1.5%	63.0%	Negligible
H29	635661	165661	1.6	40	0.70	20.00	1.8%	50.0%	Negligible
H30	635606	165627	1.6	40	0.74	20.04	1.9%	50.1%	Negligible
H31	635903	165323	1.6	40	0.62	19.92	1.6%	49.8%	Negligible
H32	635777	165134	1.6	40	0.72	27.34	1.8%	68.4%	Negligible
H33	634774	165056	1.6	40	1.60	20.90	4.0%	52.2%	Negligible
H34	634770	165249	1.6	40	2.07	21.37	5.2%	53.4%	Negligible
H35	634726	165251	1.6	40	2.25	21.55	5.6%	53.9%	Slight
H36	634682	165251	1.6	40	2.44	21.74	6.1%	54.4%	Slight
H37	634646	165253	1.6	40	2.62	21.92	6.6%	54.8%	Slight
H38	634602	165260	1.6	40	2.90	22.20	7.2%	55.5%	Slight
H39	634603	165217	1.6	40	2.61	21.91	6.5%	54.8%	Slight
H40	634601	165182	1.6	40	2.40	21.70	6.0%	54.3%	Slight
H41	634599	165138	1.6	40	2.17	21.47	5.4%	53.7%	Negligible
H42	634596	165101	1.6	40	2.01	21.31	5.0%	53.3%	Negligible
H43	634450	165100	1.6	40	2.27	21.57	5.7%	53.9%	Slight
H44	634382	165134	1.6	40	2.42	21.72	6.0%	54.3%	Slight
H45	634518	164793	1.6	40	1.28	23.23	3.2%	58.1%	Negligible
H46	633418	164980	1.6	40	1.26	20.56	3.1%	51.4%	Negligible
H47	633287	164842	1.6	40	1.03	20.33	2.6%	50.8%	Negligible
H48	633076	164912	1.6	40	1.11	20.41	2.8%	51.0%	Negligible
H49	632465	165443	1.6	40	2.22	25.30	5.6%	63.3%	Slight
H50	632426	165384	1.6	40	1.92	23.49	4.8%	58.7%	Negligible
H51	632378	165324	1.6	40	1.69	20.99	4.2%	52.5%	Negligible
H52	632242	165162	1.6	40	1.28	20.58	3.2%	51.4%	Negligible
H53	632166	165091	1.6	40	1.16	20.46	2.9%	51.2%	Negligible
H54	632064	165515	1.6	40	2.31	26.56	5.8%	66.4%	Slight
H55	632023	165273	1.6	40	1.50	20.80	3.7%	52.0%	Negligible

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
H56	631079	165231	1.6	40	0.91	20.21	2.3%	50.5%	Negligible
H57	630849	165341	1.6	40	0.78	20.08	1.9%	50.2%	Negligible
H58	631238	165328	1.6	40	1.11	20.41	2.8%	51.0%	Negligible
H59	631258	165433	1.6	40	1.17	20.47	2.9%	51.2%	Negligible
H60	631203	165516	1.6	40	1.13	22.31	2.8%	55.8%	Negligible
H61	631139	165561	1.6	40	1.06	22.67	2.6%	56.7%	Negligible
H62	631045	165700	1.6	40	0.93	26.85	2.3%	67.1%	Negligible
H63	631091	165778	1.6	40	0.89	20.19	2.2%	50.5%	Negligible
H64	631111	165805	1.6	40	1.40	26.52	3.5%	66.3%	Negligible
H65	631115	165852	1.6	40	1.17	27.49	2.9%	68.7%	Negligible
H66	631061	165470	1.6	40	0.96	20.26	2.4%	50.6%	Negligible
H67	634597	166287	1.6	40	2.10	21.40	5.3%	53.5%	Negligible
H68	635335	165657	1.6	40	0.95	20.25	2.4%	50.6%	Negligible
H69	634417	165213	1.6	40	3.14	22.44	7.8%	56.1%	Slight
H70	631268	165516	1.6	40	1.22	22.63	3.1%	56.6%	Negligible
A01	628199	169135	1.6	40	0.10	19.40	0.2%	48.5%	Negligible
A02	629810	168213	1.6	40	0.17	19.47	0.4%	48.7%	Negligible
A03	630337	168165	1.6	40	0.23	19.53	0.6%	48.8%	Negligible
A04	631554	168915	1.6	40	0.36	19.66	0.9%	49.2%	Negligible
A05	632410	169167	1.6	40	0.36	19.66	0.9%	49.1%	Negligible
A06	633542	169294	1.6	40	0.35	19.65	0.9%	49.1%	Negligible
A07	635052	169313	1.6	40	0.40	19.70	1.0%	49.3%	Negligible
A08	635998	168591	1.6	40	0.42	19.72	1.0%	49.3%	Negligible
A09	635909	167560	1.6	40	0.53	19.83	1.3%	49.6%	Negligible
A10	635754	166743	1.6	40	0.64	19.94	1.6%	49.8%	Negligible
A11	635574	165975	1.6	40	0.74	20.04	1.9%	50.1%	Negligible
A12	635125	165203	1.6	40	1.22	20.52	3.0%	51.3%	Negligible
A13	634752	165243	1.6	40	2.12	21.42	5.3%	53.6%	Negligible
A14	634369	165285	1.6	40	3.87	23.17	9.7%	57.9%	Slight
A15	634356	165091	1.6	40	2.14	21.44	5.3%	53.6%	Negligible
A16	634362	164473	1.6	40	0.84	20.14	2.1%	50.4%	Negligible
A17	634276	164112	1.6	40	0.59	19.89	1.5%	49.7%	Negligible
A18	634556	163810	1.6	40	0.50	19.80	1.2%	49.5%	Negligible
A19	634834	164066	1.6	40	0.56	19.86	1.4%	49.6%	Negligible
A20	635064	163939	1.6	40	0.49	19.79	1.2%	49.5%	Negligible
A21	635416	164358	1.6	40	0.62	19.92	1.5%	49.8%	Negligible
A22	630226	169070	1.6	40	0.20	35.50	0.5%	88.8%	Negligible
A23	630235	169089	1.6	40	0.20	35.50	0.5%	88.8%	Negligible
A24	630253	169081	1.6	40	0.20	35.50	0.5%	88.8%	Negligible
A25	630270	169076	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A26	630288	169071	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A27	630308	169071	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A28	630308	169058	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A29	630290	169050	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A30	630276	169045	1.6	40	0.21	35.51	0.5%	88.8%	Negligible
A31	630254	169033	1.6	40	0.20	35.50	0.5%	88.8%	Negligible
A32	637052	165324	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A33	637046	165372	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A34	637074	165376	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A35	637065	165340	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A36	637075	165331	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A37	637104	165345	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A38	637140	165328	1.6	40	0.32	38.32	0.8%	95.8%	Slight
A39	637119	165323	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A40	637099	165327	1.6	40	0.33	38.33	0.8%	95.8%	Slight

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
A41	637082	165319	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A42	637085	165289	1.6	40	0.33	38.33	0.8%	95.8%	Slight
A43	637063	165280	1.6	40	0.33	38.33	0.8%	95.8%	Slight
M01	635931	165331	1.6	40	0.61	19.91	1.5%	49.8%	Negligible
M02	638483	165430	1.6	40	0.20	19.50	0.5%	48.7%	Negligible
M03	630284	169052	1.6	40	0.21	19.51	0.5%	48.8%	Negligible
M04	639019	167981	1.6	40	0.14	19.44	0.4%	48.6%	Negligible
M05	635539	169840	1.6	40	0.33	19.63	0.8%	49.1%	Negligible
M06	630254	169037	1.6	40	0.20	19.50	0.5%	48.8%	Negligible
M07	634445	164416	1.6	40	0.82	20.12	2.0%	50.3%	Negligible
M08	638492	165410	1.6	40	0.20	19.50	0.5%	48.7%	Negligible
M09	639097	165971	1.6	40	0.16	19.46	0.4%	48.6%	Negligible
M10	634662	166026	1.6	40	2.63	21.93	6.6%	54.8%	Slight
M11	632984	166419	1.6	40	2.28	21.58	5.7%	54.0%	Slight
M12	631161	165486	1.6	40	1.07	20.37	2.7%	50.9%	Negligible
M13	636570	167891	1.6	40	0.37	19.67	0.9%	49.2%	Negligible
M14	636405	168227	1.6	40	0.38	19.68	1.0%	49.2%	Negligible
M15	635932	165333	1.6	40	0.61	19.91	1.5%	49.8%	Negligible
M16	630438	169111	1.6	40	0.22	19.52	0.5%	48.8%	Negligible
M17	630186	168983	1.6	40	0.20	19.50	0.5%	48.7%	Negligible
M18	638616	165564	1.6	40	0.19	19.49	0.5%	48.7%	Negligible
M19	638472	165432	1.6	40	0.20	19.50	0.5%	48.8%	Negligible
M20	637135	165354	1.6	40	0.32	19.62	0.8%	49.1%	Negligible
M21	636815	167297	1.6	40	0.32	19.62	0.8%	49.1%	Negligible
M22	638220	168614	1.6	40	0.19	19.49	0.5%	48.7%	Negligible
M23	637112	165331	1.6	40	0.33	19.63	0.8%	49.1%	Negligible
M24	638536	165465	1.6	40	0.20	19.50	0.5%	48.7%	Negligible
M25	637092	165340	1.6	40	0.33	19.63	0.8%	49.1%	Negligible
M26	638528	165426	1.6	40	0.20	19.50	0.5%	48.7%	Negligible
M27	634752	170679	1.6	40	0.26	19.56	0.7%	48.9%	Negligible

Year 20. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	200	19.89	39.19	9.9%	19.6%	
H02	631165	166314	1.6	200	17.05	36.35	8.5%	18.2%	
H03	631186	166424	1.6	200	22.06	41.36	11.0%	20.7%	
H04	631003	166651	1.6	200	21.25	40.55	10.6%	20.3%	
H05	630864	166832	1.6	200	17.32	36.62	8.7%	18.3%	
H06	632086	166298	1.6	200	24.83	44.13	12.4%	22.1%	
H07	632159	166430	1.6	200	20.94	40.24	10.5%	20.1%	
H08	632489	166193	1.6	200	17.30	36.60	8.6%	18.3%	
H09	632629	166210	1.6	200	16.24	35.54	8.1%	17.8%	
H10	633019	166385	1.6	200	18.30	37.60	9.1%	18.8%	
H11	633039	166403	1.6	200	20.06	39.36	10.0%	19.7%	
H12	633126	166502	1.6	200	18.79	38.09	9.4%	19.0%	
H13	633285	166619	1.6	200	16.39	35.69	8.2%	17.8%	
H14	633912	166981	1.6	200	17.53	36.83	8.8%	18.4%	
H15	634183	166374	1.6	200	22.56	41.86	11.3%	20.9%	
H16	634509	166374	1.6	200	26.09	45.39	13.0%	22.7%	
H17	634621	166241	1.6	200	22.83	42.13	11.4%	21.1%	
H18	634640	166153	1.6	200	24.18	43.48	12.1%	21.7%	
H19	634680	166079	1.6	200	25.09	44.39	12.5%	22.2%	
H20	634651	165954	1.6	200	25.66	44.96	12.8%	22.5%	
H21	634584	165938	1.6	200	28.49	47.79	14.2%	23.9%	
H22	634694	165880	1.6	200	26.57	45.87	13.3%	22.9%	
H23	634455	165807	1.6	200	31.88	51.18	15.9%	25.6%	
H24	635028	166030	1.6	200	24.56	43.86	12.3%	21.9%	
H25	635479	166321	1.6	200	21.58	40.88	10.8%	20.4%	
H26	635757	166282	1.6	200	19.57	38.87	9.8%	19.4%	
H27	636106	166044	1.6	200	19.14	38.44	9.6%	19.2%	
H28	636063	165787	1.6	200	20.66	39.96	10.3%	20.0%	
H29	635661	165661	1.6	200	27.34	46.64	13.7%	23.3%	
H30	635606	165627	1.6	200	27.03	46.33	13.5%	23.2%	
H31	635903	165323	1.6	200	27.58	46.88	13.8%	23.4%	
H32	635777	165134	1.6	200	31.71	51.01	15.9%	25.5%	
H33	634774	165056	1.6	200	46.92	66.22	23.5%	33.1%	
H34	634770	165249	1.6	200	62.98	82.28	31.5%	41.1%	
H35	634726	165251	1.6	200	60.88	80.18	30.4%	40.1%	
H36	634682	165251	1.6	200	65.80	85.10	32.9%	42.6%	
H37	634646	165253	1.6	200	64.26	83.56	32.1%	41.8%	
H38	634602	165260	1.6	200	60.50	79.80	30.3%	39.9%	
H39	634603	165217	1.6	200	55.95	75.25	28.0%	37.6%	
H40	634601	165182	1.6	200	50.33	69.63	25.2%	34.8%	
H41	634599	165138	1.6	200	45.66	64.96	22.8%	32.5%	
H42	634596	165101	1.6	200	42.94	62.24	21.5%	31.1%	
H43	634450	165100	1.6	200	41.49	60.79	20.7%	30.4%	
H44	634382	165134	1.6	200	42.56	61.86	21.3%	30.9%	
H45	634518	164793	1.6	200	28.38	47.68	14.2%	23.8%	
H46	633418	164980	1.6	200	18.96	38.26	9.5%	19.1%	
H47	633287	164842	1.6	200	18.72	38.02	9.4%	19.0%	
H48	633076	164912	1.6	200	16.30	35.60	8.2%	17.8%	
H49	632465	165443	1.6	200	24.18	43.48	12.1%	21.7%	

Year 20. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H50	632426	165384	1.6	200	24.26	43.56	12.1%	21.8%	
H51	632378	165324	1.6	200	24.26	43.56	12.1%	21.8%	
H52	632242	165162	1.6	200	21.77	41.07	10.9%	20.5%	
H53	632166	165091	1.6	200	19.96	39.26	10.0%	19.6%	
H54	632064	165515	1.6	200	29.40	48.70	14.7%	24.4%	
H55	632023	165273	1.6	200	23.55	42.85	11.8%	21.4%	
H56	631079	165231	1.6	200	31.69	50.99	15.8%	25.5%	
H57	630849	165341	1.6	200	32.81	52.11	16.4%	26.1%	
H58	631238	165328	1.6	200	36.29	55.59	18.1%	27.8%	
H59	631258	165433	1.6	200	40.40	59.70	20.2%	29.8%	
H60	631203	165516	1.6	200	39.85	59.15	19.9%	29.6%	
H61	631139	165561	1.6	200	43.22	62.52	21.6%	31.3%	
H62	631045	165700	1.6	200	50.19	69.49	25.1%	34.7%	
H63	631091	165778	1.6	200	43.61	62.91	21.8%	31.5%	
H64	631111	165805	1.6	200	46.53	65.83	23.3%	32.9%	
H65	631115	165852	1.6	200	45.19	64.49	22.6%	32.2%	
H66	631061	165470	1.6	200	37.03	56.33	18.5%	28.2%	
H67	634597	166287	1.6	200	23.76	43.06	11.9%	21.5%	
H68	635335	165657	1.6	200	34.44	53.74	17.2%	26.9%	
H69	634417	165213	1.6	200	48.15	67.45	24.1%	33.7%	
H70	631268	165516	1.6	200	46.56	65.86	23.3%	32.9%	
S01	633172	166482	1.6	200	19.16	38.46	9.6%	19.2%	
S02	633258	166471	1.6	200	18.56	37.86	9.3%	18.9%	
S03	633351	166555	1.6	200	19.67	38.97	9.8%	19.5%	
S04	634633	165956	1.6	200	27.10	46.40	13.5%	23.2%	
S05	635743	166131	1.6	200	21.67	40.97	10.8%	20.5%	
S06	636110	165647	1.6	200	20.81	40.11	10.4%	20.1%	
S07	631121	165603	1.6	200	43.60	62.90	21.8%	31.5%	
S08	631189	165670	1.6	200	56.60	75.90	28.3%	38.0%	
A01	628199	169135	1.6	200	4.46	23.76	2.2%	11.9%	
A02	629810	168213	1.6	200	10.98	30.28	5.5%	15.1%	
A03	630337	168165	1.6	200	10.24	29.54	5.1%	14.8%	
A04	631554	168915	1.6	200	13.01	32.31	6.5%	16.2%	
A05	632410	169167	1.6	200	12.83	32.13	6.4%	16.1%	
A06	633542	169294	1.6	200	10.96	30.26	5.5%	15.1%	
A07	635052	169313	1.6	200	9.82	29.12	4.9%	14.6%	
A08	635998	168591	1.6	200	9.84	29.14	4.9%	14.6%	
A09	635909	167560	1.6	200	11.15	30.45	5.6%	15.2%	
A10	635754	166743	1.6	200	17.90	37.20	8.9%	18.6%	
A11	635574	165975	1.6	200	21.76	41.06	10.9%	20.5%	
A12	635125	165203	1.6	200	53.19	72.49	26.6%	36.2%	
A13	634752	165243	1.6	200	60.98	80.28	30.5%	40.1%	
A14	634369	165285	1.6	200	51.86	71.16	25.9%	35.6%	
A15	634356	165091	1.6	200	40.55	59.85	20.3%	29.9%	
A16	634362	164473	1.6	200	21.64	40.94	10.8%	20.5%	
A17	634276	164112	1.6	200	19.22	38.52	9.6%	19.3%	
A18	634556	163810	1.6	200	18.84	38.14	9.4%	19.1%	
A19	634834	164066	1.6	200	20.72	40.02	10.4%	20.0%	
A20	635064	163939	1.6	200	22.26	41.56	11.1%	20.8%	

Year 20. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
A21	635416	164358	1.6	200	29.76	49.06	14.9%	24.5%	
A22	630226	169070	1.6	200	9.16	44.46	4.6%	22.2%	
A23	630235	169089	1.6	200	9.20	44.50	4.6%	22.3%	
A24	630253	169081	1.6	200	9.28	44.58	4.6%	22.3%	
A25	630270	169076	1.6	200	9.41	44.71	4.7%	22.4%	
A26	630288	169071	1.6	200	9.64	44.94	4.8%	22.5%	
A27	630308	169071	1.6	200	9.92	45.22	5.0%	22.6%	
A28	630308	169058	1.6	200	9.85	45.15	4.9%	22.6%	
A29	630290	169050	1.6	200	9.55	44.85	4.8%	22.4%	
A30	630276	169045	1.6	200	9.37	44.67	4.7%	22.3%	
A31	630254	169033	1.6	200	9.28	44.58	4.6%	22.3%	
A32	637052	165324	1.6	200	18.48	56.48	9.2%	28.2%	
A33	637046	165372	1.6	200	19.20	57.20	9.6%	28.6%	
A34	637074	165376	1.6	200	18.97	56.97	9.5%	28.5%	
A35	637065	165340	1.6	200	18.79	56.79	9.4%	28.4%	
A36	637075	165331	1.6	200	18.53	56.53	9.3%	28.3%	
A37	637104	165345	1.6	200	18.71	56.71	9.4%	28.4%	
A38	637140	165328	1.6	200	18.17	56.17	9.1%	28.1%	
A39	637119	165323	1.6	200	18.15	56.15	9.1%	28.1%	
A40	637099	165327	1.6	200	18.33	56.33	9.2%	28.2%	
A41	637082	165319	1.6	200	18.23	56.23	9.1%	28.1%	
A42	637085	165289	1.6	200	17.49	55.49	8.7%	27.7%	
A43	637063	165280	1.6	200	17.35	55.35	8.7%	27.7%	
M01	635931	165331	1.6	200	26.84	46.14	13.4%	23.1%	
M02	638483	165430	1.6	200	11.69	30.99	5.8%	15.5%	
M03	630284	169052	1.6	200	9.48	28.78	4.7%	14.4%	
M04	639019	167981	1.6	200	7.73	27.03	3.9%	13.5%	
M05	635539	169840	1.6	200	9.24	28.54	4.6%	14.3%	
M06	630254	169037	1.6	200	9.28	28.58	4.6%	14.3%	
M07	634445	164416	1.6	200	21.91	41.21	11.0%	20.6%	
M08	638492	165410	1.6	200	11.51	30.81	5.8%	15.4%	
M09	639097	165971	1.6	200	8.21	27.51	4.1%	13.8%	
M10	634662	166026	1.6	200	25.69	44.99	12.8%	22.5%	
M11	632984	166419	1.6	200	17.49	36.79	8.7%	18.4%	
M12	631161	165486	1.6	200	40.02	59.32	20.0%	29.7%	
M13	636570	167891	1.6	200	9.82	29.12	4.9%	14.6%	
M14	636405	168227	1.6	200	9.94	29.24	5.0%	14.6%	
M15	635932	165333	1.6	200	26.76	46.06	13.4%	23.0%	
M16	630438	169111	1.6	200	10.03	29.33	5.0%	14.7%	
M17	630186	168983	1.6	200	9.09	28.39	4.5%	14.2%	
M18	638616	165564	1.6	200	9.84	29.14	4.9%	14.6%	
M19	638472	165432	1.6	200	11.73	31.03	5.9%	15.5%	
M20	637135	165354	1.6	200	18.54	37.84	9.3%	18.9%	
M21	636815	167297	1.6	200	10.56	29.86	5.3%	14.9%	
M22	638220	168614	1.6	200	5.87	25.17	2.9%	12.6%	
M23	637112	165331	1.6	200	18.36	37.66	9.2%	18.8%	
M24	638536	165465	1.6	200	11.38	30.68	5.7%	15.3%	
M25	637092	165340	1.6	200	18.66	37.96	9.3%	19.0%	
M26	638528	165426	1.6	200	11.54	30.84	5.8%	15.4%	

Year 20. Concentrations from airport operation.
99.79th percentile hourly mean NO2 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	200	10.21	29.51	5.1%	14.8%	

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	40	0.07	18.86	0.2%	47.1%	Negligible
H02	631165	166314	1.6	40	0.05	18.50	0.1%	46.3%	Negligible
H03	631186	166424	1.6	40	0.05	18.50	0.1%	46.2%	Negligible
H04	631003	166651	1.6	40	0.04	18.49	0.1%	46.2%	Negligible
H05	630864	166832	1.6	40	0.03	16.93	0.1%	42.3%	Negligible
H06	632086	166298	1.6	40	0.31	16.27	0.8%	40.7%	Negligible
H07	632159	166430	1.6	40	0.22	16.18	0.6%	40.5%	Negligible
H08	632489	166193	1.6	40	0.22	17.36	0.5%	43.4%	Negligible
H09	632629	166210	1.6	40	0.27	17.86	0.7%	44.7%	Negligible
H10	633019	166385	1.6	40	0.15	15.99	0.4%	40.0%	Negligible
H11	633039	166403	1.6	40	0.17	15.72	0.4%	39.3%	Negligible
H12	633126	166502	1.6	40	0.13	15.28	0.3%	38.2%	Negligible
H13	633285	166619	1.6	40	0.11	14.99	0.3%	37.5%	Negligible
H14	633912	166981	1.6	40	0.09	15.22	0.2%	38.0%	Negligible
H15	634183	166374	1.6	40	0.24	16.42	0.6%	41.1%	Negligible
H16	634509	166374	1.6	40	0.21	16.39	0.5%	41.0%	Negligible
H17	634621	166241	1.6	40	0.34	17.54	0.8%	43.9%	Negligible
H18	634640	166153	1.6	40	0.30	17.33	0.7%	43.3%	Negligible
H19	634680	166079	1.6	40	0.27	16.29	0.7%	40.7%	Negligible
H20	634651	165954	1.6	40	0.29	16.12	0.7%	40.3%	Negligible
H21	634584	165938	1.6	40	0.34	16.03	0.9%	40.1%	Negligible
H22	634694	165880	1.6	40	0.26	15.94	0.6%	39.9%	Negligible
H23	634455	165807	1.6	40	0.55	16.24	1.4%	40.6%	Negligible
H24	635028	166030	1.6	40	0.18	18.09	0.4%	45.2%	Negligible
H25	635479	166321	1.6	40	0.07	16.67	0.2%	41.7%	Negligible
H26	635757	166282	1.6	40	0.05	16.66	0.1%	41.6%	Negligible
H27	636106	166044	1.6	40	0.04	15.26	0.1%	38.1%	Negligible
H28	636063	165787	1.6	40	0.05	16.30	0.1%	40.8%	Negligible
H29	635661	165661	1.6	40	0.06	16.97	0.1%	42.4%	Negligible
H30	635606	165627	1.6	40	0.06	16.97	0.2%	42.4%	Negligible
H31	635903	165323	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
H32	635777	165134	1.6	40	0.07	18.46	0.2%	46.2%	Negligible
H33	634774	165056	1.6	40	0.14	15.83	0.4%	39.6%	Negligible
H34	634770	165249	1.6	40	0.17	15.86	0.4%	39.6%	Negligible
H35	634726	165251	1.6	40	0.19	15.87	0.5%	39.7%	Negligible
H36	634682	165251	1.6	40	0.20	15.89	0.5%	39.7%	Negligible
H37	634646	165253	1.6	40	0.22	15.90	0.5%	39.8%	Negligible
H38	634602	165260	1.6	40	0.24	15.92	0.6%	39.8%	Negligible
H39	634603	165217	1.6	40	0.22	15.91	0.6%	39.8%	Negligible
H40	634601	165182	1.6	40	0.21	15.90	0.5%	39.7%	Negligible
H41	634599	165138	1.6	40	0.20	15.89	0.5%	39.7%	Negligible
H42	634596	165101	1.6	40	0.19	15.88	0.5%	39.7%	Negligible
H43	634450	165100	1.6	40	0.22	15.90	0.5%	39.8%	Negligible
H44	634382	165134	1.6	40	0.25	15.94	0.6%	39.8%	Negligible
H45	634518	164793	1.6	40	0.11	16.35	0.3%	40.9%	Negligible
H46	633418	164980	1.6	40	0.05	16.53	0.1%	41.3%	Negligible
H47	633287	164842	1.6	40	0.04	16.53	0.1%	41.3%	Negligible
H48	633076	164912	1.6	40	0.05	16.53	0.1%	41.3%	Negligible
H49	632465	165443	1.6	40	0.08	17.06	0.2%	42.7%	Negligible
H50	632426	165384	1.6	40	0.07	16.81	0.2%	42.0%	Negligible
H51	632378	165324	1.6	40	0.06	16.45	0.2%	41.1%	Negligible
H52	632242	165162	1.6	40	0.07	16.46	0.2%	41.1%	Negligible
H53	632166	165091	1.6	40	0.08	16.47	0.2%	41.2%	Negligible
H54	632064	165515	1.6	40	0.48	17.65	1.2%	44.1%	Negligible
H55	632023	165273	1.6	40	0.21	16.60	0.5%	41.5%	Negligible

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A	Impact
H56	631079	165231	1.6	40	0.08	16.93	0.2%	42.3%	Negligible
H57	630849	165341	1.6	40	0.07	16.52	0.2%	41.3%	Negligible
H58	631238	165328	1.6	40	0.10	16.95	0.2%	42.4%	Negligible
H59	631258	165433	1.6	40	0.10	16.95	0.2%	42.4%	Negligible
H60	631203	165516	1.6	40	0.10	17.24	0.2%	43.1%	Negligible
H61	631139	165561	1.6	40	0.09	17.31	0.2%	43.3%	Negligible
H62	631045	165700	1.6	40	0.08	17.98	0.2%	44.9%	Negligible
H63	631091	165778	1.6	40	0.07	16.92	0.2%	42.3%	Negligible
H64	631111	165805	1.6	40	0.17	18.08	0.4%	45.2%	Negligible
H65	631115	165852	1.6	40	0.13	18.27	0.3%	45.7%	Negligible
H66	631061	165470	1.6	40	0.08	16.93	0.2%	42.3%	Negligible
H67	634597	166287	1.6	40	0.21	15.94	0.5%	39.8%	Negligible
H68	635335	165657	1.6	40	0.08	16.99	0.2%	42.5%	Negligible
H69	634417	165213	1.6	40	0.31	16.00	0.8%	40.0%	Negligible
H70	631268	165516	1.6	40	0.10	17.29	0.3%	43.2%	Negligible
A01	628199	169135	1.6	40	0.01	14.29	0.0%	35.7%	Negligible
A02	629810	168213	1.6	40	0.01	15.99	0.0%	40.0%	Negligible
A03	630337	168165	1.6	40	0.02	15.55	0.0%	38.9%	Negligible
A04	631554	168915	1.6	40	0.03	16.41	0.1%	41.0%	Negligible
A05	632410	169167	1.6	40	0.03	15.47	0.1%	38.7%	Negligible
A06	633542	169294	1.6	40	0.02	15.72	0.0%	39.3%	Negligible
A07	635052	169313	1.6	40	0.03	14.77	0.1%	36.9%	Negligible
A08	635998	168591	1.6	40	0.03	16.06	0.1%	40.2%	Negligible
A09	635909	167560	1.6	40	0.04	16.59	0.1%	41.5%	Negligible
A10	635754	166743	1.6	40	0.06	16.66	0.1%	41.7%	Negligible
A11	635574	165975	1.6	40	0.06	16.97	0.2%	42.4%	Negligible
A12	635125	165203	1.6	40	0.10	17.02	0.3%	42.5%	Negligible
A13	634752	165243	1.6	40	0.18	15.86	0.4%	39.7%	Negligible
A14	634369	165285	1.6	40	0.42	16.11	1.1%	40.3%	Negligible
A15	634356	165091	1.6	40	0.22	15.91	0.6%	39.8%	Negligible
A16	634362	164473	1.6	40	0.08	15.80	0.2%	39.5%	Negligible
A17	634276	164112	1.6	40	0.05	15.77	0.1%	39.4%	Negligible
A18	634556	163810	1.6	40	0.04	14.52	0.1%	36.3%	Negligible
A19	634834	164066	1.6	40	0.04	15.76	0.1%	39.4%	Negligible
A20	635064	163939	1.6	40	0.04	13.90	0.1%	34.8%	Negligible
A21	635416	164358	1.6	40	0.05	15.90	0.1%	39.8%	Negligible
A22	630226	169070	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A23	630235	169089	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A24	630253	169081	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A25	630270	169076	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A26	630288	169071	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A27	630308	169071	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A28	630308	169058	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A29	630290	169050	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A30	630276	169045	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A31	630254	169033	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
A32	637052	165324	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A33	637046	165372	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A34	637074	165376	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A35	637065	165340	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A36	637075	165331	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A37	637104	165345	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A38	637140	165328	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A39	637119	165323	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A40	637099	165327	1.6	40	0.03	15.14	0.1%	37.9%	Negligible

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM10 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A41	637082	165319	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A42	637085	165289	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
A43	637063	165280	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
M01	635931	165331	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
M02	638483	165430	1.6	40	0.02	14.90	0.0%	37.2%	Negligible
M03	630284	169052	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
M04	639019	167981	1.6	40	0.01	14.70	0.0%	36.8%	Negligible
M05	635539	169840	1.6	40	0.02	14.77	0.1%	36.9%	Negligible
M06	630254	169037	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
M07	634445	164416	1.6	40	0.07	15.79	0.2%	39.5%	Negligible
M08	638492	165410	1.6	40	0.02	14.90	0.0%	37.2%	Negligible
M09	639097	165971	1.6	40	0.01	13.72	0.0%	34.3%	Negligible
M10	634662	166026	1.6	40	0.27	15.99	0.7%	40.0%	Negligible
M11	632984	166419	1.6	40	0.10	16.07	0.3%	40.2%	Negligible
M12	631161	165486	1.6	40	0.09	16.94	0.2%	42.4%	Negligible
M13	636570	167891	1.6	40	0.03	16.19	0.1%	40.5%	Negligible
M14	636405	168227	1.6	40	0.03	16.59	0.1%	41.5%	Negligible
M15	635932	165333	1.6	40	0.05	16.96	0.1%	42.4%	Negligible
M16	630438	169111	1.6	40	0.02	14.63	0.0%	36.6%	Negligible
M17	630186	168983	1.6	40	0.02	15.54	0.0%	38.9%	Negligible
M18	638616	165564	1.6	40	0.01	14.89	0.0%	37.2%	Negligible
M19	638472	165432	1.6	40	0.02	14.90	0.0%	37.2%	Negligible
M20	637135	165354	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
M21	636815	167297	1.6	40	0.03	16.19	0.1%	40.5%	Negligible
M22	638220	168614	1.6	40	0.01	15.00	0.0%	37.5%	Negligible
M23	637112	165331	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
M24	638536	165465	1.6	40	0.02	14.90	0.0%	37.2%	Negligible
M25	637092	165340	1.6	40	0.03	15.14	0.1%	37.9%	Negligible
M26	638528	165426	1.6	40	0.02	14.90	0.0%	37.2%	Negligible
M27	634752	170679	1.6	40	0.02	14.52	0.0%	36.3%	Negligible

Year 20. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedance	% PEC of A	Impact
H01	631215	166224	1.6	35	2	6.1%	
H02	631165	166314	1.6	35	2	5.2%	
H03	631186	166424	1.6	35	2	5.2%	
H04	631003	166651	1.6	35	2	5.2%	
H05	630864	166832	1.6	35	1	2.0%	
H06	632086	166298	1.6	35	0	1.2%	
H07	632159	166430	1.6	35	0	1.1%	
H08	632489	166193	1.6	35	1	2.7%	
H09	632629	166210	1.6	35	1	3.7%	
H10	633019	166385	1.6	35	0	0.9%	
H11	633039	166403	1.6	35	0	0.7%	
H12	633126	166502	1.6	35	0	0.4%	
H13	633285	166619	1.6	35	0	0.4%	
H14	633912	166981	1.6	35	0	0.4%	
H15	634183	166374	1.6	35	0	1.3%	
H16	634509	166374	1.6	35	0	1.3%	
H17	634621	166241	1.6	35	1	3.1%	
H18	634640	166153	1.6	35	1	2.7%	
H19	634680	166079	1.6	35	0	1.2%	
H20	634651	165954	1.6	35	0	1.0%	
H21	634584	165938	1.6	35	0	0.9%	
H22	634694	165880	1.6	35	0	0.8%	
H23	634455	165807	1.6	35	0	1.1%	
H24	635028	166030	1.6	35	1	4.2%	
H25	635479	166321	1.6	35	1	1.6%	
H26	635757	166282	1.6	35	1	1.6%	
H27	636106	166044	1.6	35	0	0.4%	
H28	636063	165787	1.6	35	0	1.2%	
H29	635661	165661	1.6	35	1	2.1%	
H30	635606	165627	1.6	35	1	2.1%	
H31	635903	165323	1.6	35	1	2.1%	
H32	635777	165134	1.6	35	2	5.1%	
H33	634774	165056	1.6	35	0	0.8%	
H34	634770	165249	1.6	35	0	0.8%	
H35	634726	165251	1.6	35	0	0.8%	
H36	634682	165251	1.6	35	0	0.8%	
H37	634646	165253	1.6	35	0	0.8%	
H38	634602	165260	1.6	35	0	0.8%	
H39	634603	165217	1.6	35	0	0.8%	
H40	634601	165182	1.6	35	0	0.8%	
H41	634599	165138	1.6	35	0	0.8%	
H42	634596	165101	1.6	35	0	0.8%	
H43	634450	165100	1.6	35	0	0.8%	
H44	634382	165134	1.6	35	0	0.8%	
H45	634518	164793	1.6	35	0	1.3%	
H46	633418	164980	1.6	35	1	1.5%	
H47	633287	164842	1.6	35	1	1.5%	
H48	633076	164912	1.6	35	1	1.5%	
H49	632465	165443	1.6	35	1	2.2%	

Year 20. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
H50	632426	165384	1.6	35	1	1.8%	
H51	632378	165324	1.6	35	0	1.4%	
H52	632242	165162	1.6	35	0	1.4%	
H53	632166	165091	1.6	35	0	1.4%	
H54	632064	165515	1.6	35	1	3.3%	
H55	632023	165273	1.6	35	1	1.6%	
H56	631079	165231	1.6	35	1	2.0%	
H57	630849	165341	1.6	35	1	1.4%	
H58	631238	165328	1.6	35	1	2.0%	
H59	631258	165433	1.6	35	1	2.0%	
H60	631203	165516	1.6	35	1	2.5%	
H61	631139	165561	1.6	35	1	2.6%	
H62	631045	165700	1.6	35	1	4.0%	
H63	631091	165778	1.6	35	1	2.0%	
H64	631111	165805	1.6	35	1	4.2%	
H65	631115	165852	1.6	35	2	4.6%	
H66	631061	165470	1.6	35	1	2.0%	
H67	634597	166287	1.6	35	0	0.8%	
H68	635335	165657	1.6	35	1	2.1%	
H69	634417	165213	1.6	35	0	0.9%	
H70	631268	165516	1.6	35	1	2.6%	
S01	633172	166482	1.6	35	0	0.3%	
S02	633258	166471	1.6	35	0	0.3%	
S03	633351	166555	1.6	35	0	0.3%	
S04	634633	165956	1.6	35	0	0.9%	
S05	635743	166131	1.6	35	1	1.6%	
S06	636110	165647	1.6	35	0	0.4%	
S07	631121	165603	1.6	35	1	2.0%	
S08	631189	165670	1.6	35	1	2.0%	
A01	628199	169135	1.6	35	0	0.4%	
A02	629810	168213	1.6	35	0	0.9%	
A03	630337	168165	1.6	35	0	0.6%	
A04	631554	168915	1.6	35	0	1.3%	
A05	632410	169167	1.6	35	0	0.5%	
A06	633542	169294	1.6	35	0	0.7%	
A07	635052	169313	1.6	35	0	0.3%	
A08	635998	168591	1.6	35	0	1.0%	
A09	635909	167560	1.6	35	1	1.5%	
A10	635754	166743	1.6	35	1	1.6%	
A11	635574	165975	1.6	35	1	2.1%	
A12	635125	165203	1.6	35	1	2.1%	
A13	634752	165243	1.6	35	0	0.8%	
A14	634369	165285	1.6	35	0	1.0%	
A15	634356	165091	1.6	35	0	0.8%	
A16	634362	164473	1.6	35	0	0.7%	
A17	634276	164112	1.6	35	0	0.7%	
A18	634556	163810	1.6	35	0	0.4%	
A19	634834	164066	1.6	35	0	0.7%	
A20	635064	163939	1.6	35	0	0.6%	

Year 20. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A	Impact
A21	635416	164358	1.6	35	0	0.8%	
A22	630226	169070	1.6	35	0	0.3%	
A23	630235	169089	1.6	35	0	0.3%	
A24	630253	169081	1.6	35	0	0.3%	
A25	630270	169076	1.6	35	0	0.3%	
A26	630288	169071	1.6	35	0	0.3%	
A27	630308	169071	1.6	35	0	0.3%	
A28	630308	169058	1.6	35	0	0.3%	
A29	630290	169050	1.6	35	0	0.3%	
A30	630276	169045	1.6	35	0	0.3%	
A31	630254	169033	1.6	35	0	0.3%	
A32	637052	165324	1.6	35	0	0.4%	
A33	637046	165372	1.6	35	0	0.4%	
A34	637074	165376	1.6	35	0	0.4%	
A35	637065	165340	1.6	35	0	0.4%	
A36	637075	165331	1.6	35	0	0.4%	
A37	637104	165345	1.6	35	0	0.4%	
A38	637140	165328	1.6	35	0	0.4%	
A39	637119	165323	1.6	35	0	0.4%	
A40	637099	165327	1.6	35	0	0.4%	
A41	637082	165319	1.6	35	0	0.4%	
A42	637085	165289	1.6	35	0	0.4%	
A43	637063	165280	1.6	35	0	0.4%	
M01	635931	165331	1.6	35	1	2.1%	
M02	638483	165430	1.6	35	0	0.3%	
M03	630284	169052	1.6	35	0	0.3%	
M04	639019	167981	1.6	35	0	0.3%	
M05	635539	169840	1.6	35	0	0.3%	
M06	630254	169037	1.6	35	0	0.3%	
M07	634445	164416	1.6	35	0	0.7%	
M08	638492	165410	1.6	35	0	0.3%	
M09	639097	165971	1.6	35	0	0.7%	
M10	634662	166026	1.6	35	0	0.9%	
M11	632984	166419	1.6	35	0	1.0%	
M12	631161	165486	1.6	35	1	2.0%	
M13	636570	167891	1.6	35	0	1.1%	
M14	636405	168227	1.6	35	1	1.5%	
M15	635932	165333	1.6	35	1	2.1%	
M16	630438	169111	1.6	35	0	0.3%	
M17	630186	168983	1.6	35	0	0.6%	
M18	638616	165564	1.6	35	0	0.3%	
M19	638472	165432	1.6	35	0	0.3%	
M20	637135	165354	1.6	35	0	0.4%	
M21	636815	167297	1.6	35	0	1.1%	
M22	638220	168614	1.6	35	0	0.4%	
M23	637112	165331	1.6	35	0	0.4%	
M24	638536	165465	1.6	35	0	0.3%	
M25	637092	165340	1.6	35	0	0.4%	
M26	638528	165426	1.6	35	0	0.3%	

Year 20. Concentrations from airport operation.
Daily mean PM10 concentrations: Number of exceedances of 50 ug/m3 per year.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (number of exce	Number of exceedanc	% PEC of A(	Impact
M27	634752	170679	1.6	35	0	0.4%	

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	25	0.05	12.96	0.2%	51.8%	Negligible
H02	631165	166314	1.6	25	0.04	12.76	0.2%	51.0%	Negligible
H03	631186	166424	1.6	25	0.04	12.76	0.1%	51.0%	Negligible
H04	631003	166651	1.6	25	0.03	12.75	0.1%	51.0%	Negligible
H05	630864	166832	1.6	25	0.02	11.53	0.1%	46.1%	Negligible
H06	632086	166298	1.6	25	0.23	11.37	0.9%	45.5%	Negligible
H07	632159	166430	1.6	25	0.16	11.30	0.7%	45.2%	Negligible
H08	632489	166193	1.6	25	0.15	11.95	0.6%	47.8%	Negligible
H09	632629	166210	1.6	25	0.18	12.23	0.7%	48.9%	Negligible
H10	633019	166385	1.6	25	0.12	11.24	0.5%	44.9%	Negligible
H11	633039	166403	1.6	25	0.13	11.09	0.5%	44.4%	Negligible
H12	633126	166502	1.6	25	0.11	10.83	0.4%	43.3%	Negligible
H13	633285	166619	1.6	25	0.10	10.67	0.4%	42.7%	Negligible
H14	633912	166981	1.6	25	0.07	10.79	0.3%	43.2%	Negligible
H15	634183	166374	1.6	25	0.18	11.45	0.7%	45.8%	Negligible
H16	634509	166374	1.6	25	0.16	11.42	0.6%	45.7%	Negligible
H17	634621	166241	1.6	25	0.23	12.08	0.9%	48.3%	Negligible
H18	634640	166153	1.6	25	0.21	11.96	0.9%	47.8%	Negligible
H19	634680	166079	1.6	25	0.20	11.37	0.8%	45.5%	Negligible
H20	634651	165954	1.6	25	0.22	11.25	0.9%	45.0%	Negligible
H21	634584	165938	1.6	25	0.26	11.21	1.0%	44.8%	Negligible
H22	634694	165880	1.6	25	0.19	11.14	0.8%	44.6%	Negligible
H23	634455	165807	1.6	25	0.41	11.36	1.6%	45.4%	Negligible
H24	635028	166030	1.6	25	0.12	12.38	0.5%	49.5%	Negligible
H25	635479	166321	1.6	25	0.05	11.56	0.2%	46.3%	Negligible
H26	635757	166282	1.6	25	0.04	11.55	0.2%	46.2%	Negligible
H27	636106	166044	1.6	25	0.03	10.87	0.1%	43.5%	Negligible
H28	636063	165787	1.6	25	0.04	11.46	0.2%	45.8%	Negligible
H29	635661	165661	1.6	25	0.04	11.65	0.2%	46.6%	Negligible
H30	635606	165627	1.6	25	0.05	11.65	0.2%	46.6%	Negligible
H31	635903	165323	1.6	25	0.04	11.64	0.2%	46.6%	Negligible
H32	635777	165134	1.6	25	0.05	12.49	0.2%	50.0%	Negligible
H33	634774	165056	1.6	25	0.11	11.06	0.4%	44.2%	Negligible
H34	634770	165249	1.6	25	0.13	11.08	0.5%	44.3%	Negligible
H35	634726	165251	1.6	25	0.14	11.09	0.6%	44.4%	Negligible
H36	634682	165251	1.6	25	0.15	11.10	0.6%	44.4%	Negligible
H37	634646	165253	1.6	25	0.16	11.11	0.7%	44.5%	Negligible
H38	634602	165260	1.6	25	0.18	11.13	0.7%	44.5%	Negligible
H39	634603	165217	1.6	25	0.17	11.12	0.7%	44.5%	Negligible
H40	634601	165182	1.6	25	0.16	11.11	0.6%	44.4%	Negligible
H41	634599	165138	1.6	25	0.15	11.10	0.6%	44.4%	Negligible
H42	634596	165101	1.6	25	0.14	11.09	0.6%	44.4%	Negligible
H43	634450	165100	1.6	25	0.16	11.11	0.6%	44.4%	Negligible
H44	634382	165134	1.6	25	0.19	11.14	0.7%	44.5%	Negligible
H45	634518	164793	1.6	25	0.08	11.32	0.3%	45.3%	Negligible
H46	633418	164980	1.6	25	0.04	11.35	0.2%	45.4%	Negligible
H47	633287	164842	1.6	25	0.03	11.34	0.1%	45.4%	Negligible
H48	633076	164912	1.6	25	0.04	11.34	0.1%	45.4%	Negligible
H49	632465	165443	1.6	25	0.06	11.71	0.2%	46.8%	Negligible
H50	632426	165384	1.6	25	0.06	11.57	0.2%	46.3%	Negligible
H51	632378	165324	1.6	25	0.05	11.36	0.2%	45.5%	Negligible
H52	632242	165162	1.6	25	0.05	11.37	0.2%	45.5%	Negligible
H53	632166	165091	1.6	25	0.06	11.37	0.2%	45.5%	Negligible
H54	632064	165515	1.6	25	0.34	12.10	1.4%	48.4%	Negligible
H55	632023	165273	1.6	25	0.15	11.47	0.6%	45.9%	Negligible
H56	631079	165231	1.6	25	0.06	11.64	0.2%	46.5%	Negligible
H57	630849	165341	1.6	25	0.05	11.35	0.2%	45.4%	Negligible

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H58	631238	165328	1.6	25	0.07	11.65	0.3%	46.6%	Negligible
H59	631258	165433	1.6	25	0.07	11.65	0.3%	46.6%	Negligible
H60	631203	165516	1.6	25	0.07	11.82	0.3%	47.3%	Negligible
H61	631139	165561	1.6	25	0.07	11.85	0.3%	47.4%	Negligible
H62	631045	165700	1.6	25	0.06	12.23	0.2%	48.9%	Negligible
H63	631091	165778	1.6	25	0.06	11.63	0.2%	46.5%	Negligible
H64	631111	165805	1.6	25	0.11	12.29	0.4%	49.1%	Negligible
H65	631115	165852	1.6	25	0.09	12.39	0.3%	49.6%	Negligible
H66	631061	165470	1.6	25	0.06	11.64	0.2%	46.6%	Negligible
H67	634597	166287	1.6	25	0.16	11.16	0.6%	44.7%	Negligible
H68	635335	165657	1.6	25	0.06	11.66	0.2%	46.6%	Negligible
H69	634417	165213	1.6	25	0.23	11.18	0.9%	44.7%	Negligible
H70	631268	165516	1.6	25	0.08	11.84	0.3%	47.4%	Negligible
A01	628199	169135	1.6	25	0.01	10.15	0.0%	40.6%	Negligible
A02	629810	168213	1.6	25	0.01	11.05	0.0%	44.2%	Negligible
A03	630337	168165	1.6	25	0.01	10.92	0.1%	43.7%	Negligible
A04	631554	168915	1.6	25	0.02	11.26	0.1%	45.0%	Negligible
A05	632410	169167	1.6	25	0.02	10.90	0.1%	43.6%	Negligible
A06	633542	169294	1.6	25	0.01	11.05	0.1%	44.2%	Negligible
A07	635052	169313	1.6	25	0.02	10.58	0.1%	42.3%	Negligible
A08	635998	168591	1.6	25	0.03	11.12	0.1%	44.5%	Negligible
A09	635909	167560	1.6	25	0.03	11.44	0.1%	45.7%	Negligible
A10	635754	166743	1.6	25	0.04	11.55	0.2%	46.2%	Negligible
A11	635574	165975	1.6	25	0.05	11.65	0.2%	46.6%	Negligible
A12	635125	165203	1.6	25	0.08	11.68	0.3%	46.7%	Negligible
A13	634752	165243	1.6	25	0.13	11.08	0.5%	44.3%	Negligible
A14	634369	165285	1.6	25	0.31	11.26	1.2%	45.0%	Negligible
A15	634356	165091	1.6	25	0.17	11.12	0.7%	44.5%	Negligible
A16	634362	164473	1.6	25	0.06	11.00	0.2%	44.0%	Negligible
A17	634276	164112	1.6	25	0.04	10.98	0.2%	43.9%	Negligible
A18	634556	163810	1.6	25	0.03	10.30	0.1%	41.2%	Negligible
A19	634834	164066	1.6	25	0.03	10.98	0.1%	43.9%	Negligible
A20	635064	163939	1.6	25	0.03	10.01	0.1%	40.0%	Negligible
A21	635416	164358	1.6	25	0.04	11.04	0.2%	44.2%	Negligible
A22	630226	169070	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A23	630235	169089	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A24	630253	169081	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A25	630270	169076	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A26	630288	169071	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A27	630308	169071	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A28	630308	169058	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A29	630290	169050	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A30	630276	169045	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A31	630254	169033	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
A32	637052	165324	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A33	637046	165372	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A34	637074	165376	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A35	637065	165340	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A36	637075	165331	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A37	637104	165345	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A38	637140	165328	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A39	637119	165323	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A40	637099	165327	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A41	637082	165319	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A42	637085	165289	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
A43	637063	165280	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
M01	635931	165331	1.6	25	0.04	11.64	0.2%	46.6%	Negligible

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean PM2.5 concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M02	638483	165430	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M03	630284	169052	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
M04	639019	167981	1.6	25	0.01	10.63	0.0%	42.5%	Negligible
M05	635539	169840	1.6	25	0.02	10.58	0.1%	42.3%	Negligible
M06	630254	169037	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
M07	634445	164416	1.6	25	0.05	11.00	0.2%	44.0%	Negligible
M08	638492	165410	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M09	639097	165971	1.6	25	0.01	9.96	0.0%	39.8%	Negligible
M10	634662	166026	1.6	25	0.20	11.20	0.8%	44.8%	Negligible
M11	632984	166419	1.6	25	0.09	11.22	0.4%	44.9%	Negligible
M12	631161	165486	1.6	25	0.07	11.65	0.3%	46.6%	Negligible
M13	636570	167891	1.6	25	0.02	11.31	0.1%	45.2%	Negligible
M14	636405	168227	1.6	25	0.02	11.54	0.1%	46.1%	Negligible
M15	635932	165333	1.6	25	0.04	11.64	0.2%	46.6%	Negligible
M16	630438	169111	1.6	25	0.01	10.43	0.1%	41.7%	Negligible
M17	630186	168983	1.6	25	0.01	10.92	0.0%	43.7%	Negligible
M18	638616	165564	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M19	638472	165432	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M20	637135	165354	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
M21	636815	167297	1.6	25	0.02	11.30	0.1%	45.2%	Negligible
M22	638220	168614	1.6	25	0.01	10.77	0.0%	43.1%	Negligible
M23	637112	165331	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
M24	638536	165465	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M25	637092	165340	1.6	25	0.02	10.89	0.1%	43.6%	Negligible
M26	638528	165426	1.6	25	0.01	10.75	0.0%	43.0%	Negligible
M27	634752	170679	1.6	25	0.01	10.38	0.1%	41.5%	Negligible

Year 20. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H01	631215	166224	1.6	3	0.11	0.11	3.8%	3.8%	
H02	631165	166314	1.6	3	0.10	0.10	3.5%	3.5%	
H03	631186	166424	1.6	3	0.09	0.09	3.0%	3.0%	
H04	631003	166651	1.6	3	0.07	0.07	2.2%	2.2%	
H05	630864	166832	1.6	3	0.05	0.05	1.8%	1.8%	
H06	632086	166298	1.6	3	0.35	0.35	11.6%	11.6%	
H07	632159	166430	1.6	3	0.28	0.28	9.4%	9.4%	
H08	632489	166193	1.6	3	0.34	0.34	11.2%	11.2%	
H09	632629	166210	1.6	3	0.36	0.36	11.8%	11.8%	
H10	633019	166385	1.6	3	0.51	0.51	16.9%	16.9%	
H11	633039	166403	1.6	3	0.55	0.55	18.5%	18.5%	
H12	633126	166502	1.6	3	0.54	0.54	18.0%	18.0%	
H13	633285	166619	1.6	3	0.60	0.60	19.9%	19.9%	
H14	633912	166981	1.6	3	0.35	0.35	11.7%	11.7%	
H15	634183	166374	1.6	3	0.44	0.44	14.7%	14.7%	
H16	634509	166374	1.6	3	0.28	0.28	9.4%	9.4%	
H17	634621	166241	1.6	3	0.28	0.28	9.4%	9.4%	
H18	634640	166153	1.6	3	0.27	0.27	9.1%	9.1%	
H19	634680	166079	1.6	3	0.27	0.27	9.2%	9.2%	
H20	634651	165954	1.6	3	0.29	0.29	9.6%	9.6%	
H21	634584	165938	1.6	3	0.30	0.30	10.1%	10.1%	
H22	634694	165880	1.6	3	0.27	0.27	9.0%	9.0%	
H23	634455	165807	1.6	3	0.39	0.39	13.1%	13.1%	
H24	635028	166030	1.6	3	0.19	0.19	6.4%	6.4%	
H25	635479	166321	1.6	3	0.12	0.12	4.2%	4.2%	
H26	635757	166282	1.6	3	0.10	0.10	3.4%	3.4%	
H27	636106	166044	1.6	3	0.09	0.09	3.1%	3.1%	
H28	636063	165787	1.6	3	0.10	0.10	3.3%	3.3%	
H29	635661	165661	1.6	3	0.12	0.12	4.0%	4.0%	
H30	635606	165627	1.6	3	0.12	0.12	4.1%	4.1%	
H31	635903	165323	1.6	3	0.11	0.11	3.5%	3.5%	
H32	635777	165134	1.6	3	0.11	0.11	3.7%	3.7%	
H33	634774	165056	1.6	3	0.18	0.18	6.2%	6.2%	
H34	634770	165249	1.6	3	0.27	0.27	9.0%	9.0%	
H35	634726	165251	1.6	3	0.27	0.27	9.0%	9.0%	
H36	634682	165251	1.6	3	0.27	0.27	9.1%	9.1%	
H37	634646	165253	1.6	3	0.28	0.28	9.3%	9.3%	
H38	634602	165260	1.6	3	0.28	0.28	9.4%	9.4%	
H39	634603	165217	1.6	3	0.27	0.27	8.9%	8.9%	
H40	634601	165182	1.6	3	0.26	0.26	8.5%	8.5%	
H41	634599	165138	1.6	3	0.23	0.23	7.7%	7.7%	
H42	634596	165101	1.6	3	0.22	0.22	7.3%	7.3%	
H43	634450	165100	1.6	3	0.23	0.23	7.8%	7.8%	
H44	634382	165134	1.6	3	0.24	0.24	8.1%	8.1%	
H45	634518	164793	1.6	3	0.16	0.16	5.2%	5.2%	
H46	633418	164980	1.6	3	0.26	0.26	8.5%	8.5%	
H47	633287	164842	1.6	3	0.20	0.20	6.7%	6.7%	
H48	633076	164912	1.6	3	0.27	0.27	8.9%	8.9%	
H49	632465	165443	1.6	3	0.39	0.39	13.0%	13.0%	

Year 20. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
H50	632426	165384	1.6	3	0.34	0.34	11.4%	11.4%	
H51	632378	165324	1.6	3	0.31	0.31	10.3%	10.3%	
H52	632242	165162	1.6	3	0.27	0.27	9.0%	9.0%	
H53	632166	165091	1.6	3	0.24	0.24	7.9%	7.9%	
H54	632064	165515	1.6	3	0.34	0.34	11.5%	11.5%	
H55	632023	165273	1.6	3	0.26	0.26	8.6%	8.6%	
H56	631079	165231	1.6	3	0.12	0.12	4.1%	4.1%	
H57	630849	165341	1.6	3	0.09	0.09	3.1%	3.1%	
H58	631238	165328	1.6	3	0.14	0.14	4.8%	4.8%	
H59	631258	165433	1.6	3	0.14	0.14	4.8%	4.8%	
H60	631203	165516	1.6	3	0.14	0.14	4.7%	4.7%	
H61	631139	165561	1.6	3	0.12	0.12	4.0%	4.0%	
H62	631045	165700	1.6	3	0.11	0.11	3.8%	3.8%	
H63	631091	165778	1.6	3	0.12	0.12	3.9%	3.9%	
H64	631111	165805	1.6	3	0.13	0.13	4.2%	4.2%	
H65	631115	165852	1.6	3	0.13	0.13	4.3%	4.3%	
H66	631061	165470	1.6	3	0.11	0.11	3.8%	3.8%	
H67	634597	166287	1.6	3	0.29	0.29	9.6%	9.6%	
H68	635335	165657	1.6	3	0.16	0.16	5.5%	5.5%	
H69	634417	165213	1.6	3	0.28	0.28	9.3%	9.3%	
H70	631268	165516	1.6	3	0.15	0.15	5.1%	5.1%	
S01	633172	166482	1.6	3	0.59	0.59	19.7%	19.7%	
S02	633258	166471	1.6	3	0.65	0.65	21.7%	21.7%	
S03	633351	166555	1.6	3	0.62	0.62	20.7%	20.7%	
S04	634633	165956	1.6	3	0.29	0.29	9.8%	9.8%	
S05	635743	166131	1.6	3	0.10	0.10	3.4%	3.4%	
S06	636110	165647	1.6	3	0.09	0.09	3.1%	3.1%	
S07	631121	165603	1.6	3	0.13	0.13	4.3%	4.3%	
S08	631189	165670	1.6	3	0.13	0.13	4.4%	4.4%	
A01	628199	169135	1.6	3	0.01	0.01	0.4%	0.4%	
A02	629810	168213	1.6	3	0.02	0.02	0.8%	0.8%	
A03	630337	168165	1.6	3	0.03	0.03	1.1%	1.1%	
A04	631554	168915	1.6	3	0.06	0.06	2.0%	2.0%	
A05	632410	169167	1.6	3	0.08	0.08	2.8%	2.8%	
A06	633542	169294	1.6	3	0.09	0.09	3.2%	3.2%	
A07	635052	169313	1.6	3	0.08	0.08	2.5%	2.5%	
A08	635998	168591	1.6	3	0.06	0.06	2.1%	2.1%	
A09	635909	167560	1.6	3	0.07	0.07	2.4%	2.4%	
A10	635754	166743	1.6	3	0.09	0.09	3.0%	3.0%	
A11	635574	165975	1.6	3	0.13	0.13	4.4%	4.4%	
A12	635125	165203	1.6	3	0.18	0.18	6.0%	6.0%	
A13	634752	165243	1.6	3	0.26	0.26	8.7%	8.7%	
A14	634369	165285	1.6	3	0.33	0.33	11.2%	11.2%	
A15	634356	165091	1.6	3	0.23	0.23	7.8%	7.8%	
A16	634362	164473	1.6	3	0.11	0.11	3.6%	3.6%	
A17	634276	164112	1.6	3	0.08	0.08	2.7%	2.7%	
A18	634556	163810	1.6	3	0.06	0.06	2.1%	2.1%	
A19	634834	164066	1.6	3	0.08	0.08	2.5%	2.5%	
A20	635064	163939	1.6	3	0.07	0.07	2.2%	2.2%	

Year 20. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
A21	635416	164358	1.6	3	0.08	0.08	2.7%	2.7%	
A22	630226	169070	1.6	3	0.03	0.03	1.0%	1.0%	
A23	630235	169089	1.6	3	0.03	0.03	1.0%	1.0%	
A24	630253	169081	1.6	3	0.03	0.03	1.0%	1.0%	
A25	630270	169076	1.6	3	0.03	0.03	1.0%	1.0%	
A26	630288	169071	1.6	3	0.03	0.03	1.0%	1.0%	
A27	630308	169071	1.6	3	0.03	0.03	1.0%	1.0%	
A28	630308	169058	1.6	3	0.03	0.03	1.0%	1.0%	
A29	630290	169050	1.6	3	0.03	0.03	1.0%	1.0%	
A30	630276	169045	1.6	3	0.03	0.03	1.0%	1.0%	
A31	630254	169033	1.6	3	0.03	0.03	1.0%	1.0%	
A32	637052	165324	1.6	3	0.05	0.05	1.8%	1.8%	
A33	637046	165372	1.6	3	0.05	0.05	1.8%	1.8%	
A34	637074	165376	1.6	3	0.05	0.05	1.8%	1.8%	
A35	637065	165340	1.6	3	0.05	0.05	1.8%	1.8%	
A36	637075	165331	1.6	3	0.05	0.05	1.8%	1.8%	
A37	637104	165345	1.6	3	0.05	0.05	1.8%	1.8%	
A38	637140	165328	1.6	3	0.05	0.05	1.7%	1.7%	
A39	637119	165323	1.6	3	0.05	0.05	1.8%	1.8%	
A40	637099	165327	1.6	3	0.05	0.05	1.8%	1.8%	
A41	637082	165319	1.6	3	0.05	0.05	1.8%	1.8%	
A42	637085	165289	1.6	3	0.06	0.06	1.9%	1.9%	
A43	637063	165280	1.6	3	0.06	0.06	1.9%	1.9%	
M01	635931	165331	1.6	3	0.11	0.11	3.5%	3.5%	
M02	638483	165430	1.6	3	0.03	0.03	1.2%	1.2%	
M03	630284	169052	1.6	3	0.03	0.03	1.0%	1.0%	
M04	639019	167981	1.6	3	0.03	0.03	0.8%	0.8%	
M05	635539	169840	1.6	3	0.07	0.07	2.2%	2.2%	
M06	630254	169037	1.6	3	0.03	0.03	1.0%	1.0%	
M07	634445	164416	1.6	3	0.10	0.10	3.4%	3.4%	
M08	638492	165410	1.6	3	0.03	0.03	1.1%	1.1%	
M09	639097	165971	1.6	3	0.03	0.03	1.0%	1.0%	
M10	634662	166026	1.6	3	0.28	0.28	9.4%	9.4%	
M11	632984	166419	1.6	3	0.44	0.44	14.8%	14.8%	
M12	631161	165486	1.6	3	0.14	0.14	4.5%	4.5%	
M13	636570	167891	1.6	3	0.05	0.05	1.8%	1.8%	
M14	636405	168227	1.6	3	0.06	0.06	1.9%	1.9%	
M15	635932	165333	1.6	3	0.10	0.10	3.5%	3.5%	
M16	630438	169111	1.6	3	0.03	0.03	1.1%	1.1%	
M17	630186	168983	1.6	3	0.03	0.03	1.0%	1.0%	
M18	638616	165564	1.6	3	0.03	0.03	1.2%	1.2%	
M19	638472	165432	1.6	3	0.03	0.03	1.2%	1.2%	
M20	637135	165354	1.6	3	0.05	0.05	1.8%	1.8%	
M21	636815	167297	1.6	3	0.05	0.05	1.8%	1.8%	
M22	638220	168614	1.6	3	0.03	0.03	1.0%	1.0%	
M23	637112	165331	1.6	3	0.05	0.05	1.7%	1.7%	
M24	638536	165465	1.6	3	0.04	0.04	1.2%	1.2%	
M25	637092	165340	1.6	3	0.05	0.05	1.7%	1.7%	
M26	638528	165426	1.6	3	0.03	0.03	1.1%	1.1%	

Year 20. Concentrations from airport operation.
98th percentile hourly odour concentrations.

Receptor n	X(m)	Y(m)	Z(m)	AQAL (µg n	PC (µg m−3	PEC (µg m−	% PC of AQ	% PEC of A(	Impact
M27	634752	170679	1.6	3	0.05	0.05	1.8%	1.8%	

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical loa	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E01	621048	168683	0	8	0.00	12.60	0.1%	157.6%	Not significant
E02	625191	169137	0	8	0.01	12.75	0.1%	159.3%	Not significant
E03	628533	169560	0	8	0.01	12.75	0.2%	159.4%	Not significant
E04	629867	169917	0	8	0.02	12.76	0.3%	159.5%	Not significant
E05	630740	169804	0	8	0.03	13.05	0.4%	163.2%	Not significant
E06	631813	170059	0	8	0.04	10.40	0.5%	130.0%	Not significant
E07	632683	170381	0	8	0.04	10.40	0.4%	129.9%	Not significant
E08	633993	170521	0	8	0.04	10.40	0.5%	130.0%	Not significant
E09	635116	170740	0	8	0.04	10.82	0.5%	135.2%	Not significant
E10	636457	171381	0	8	0.03	10.81	0.4%	135.1%	Not significant
E11	637964	171321	0	8	0.02	10.80	0.3%	135.1%	Not significant
E12	639028	171113	0	8	0.02	10.80	0.3%	135.0%	Not significant
E13	639841	170161	0	8	0.02	10.80	0.2%	135.0%	Not significant
E14	639882	168631	0	8	0.02	13.18	0.2%	164.7%	Not significant
E15	639810	167452	0	8	0.02	13.18	0.2%	164.7%	Not significant
E16	639527	166684	0	8	0.02	13.18	0.2%	164.7%	Not significant
E17	639241	165688	0	8	0.02	13.18	0.3%	164.8%	Not significant
E18	638891	165003	0	Not sensitive	0.03	13.19	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	0.03	10.81	N/A	N/A	Not significant
E20	637303	164087	0	8	0.04	10.82	0.5%	135.3%	Not significant
E21	636318	164194	0	8	0.06	10.84	0.8%	135.5%	Not significant
E22	635298	164386	0	8	0.09	10.87	1.2%	135.9%	Further assessment required
E23	634800	164047	0	8	0.08	13.52	1.0%	169.0%	Further assessment required
E24	634346	163650	0	8	0.06	13.50	0.8%	168.8%	Not significant
E25	633796	162733	0	8	0.03	13.47	0.4%	168.4%	Not significant
E26	633703	162425	0	8	0.03	13.47	0.4%	168.4%	Not significant
E27	634513	161455	0	8	0.03	13.47	0.3%	168.3%	Not significant
E28	633502	161188	0	8	0.02	13.46	0.3%	168.3%	Not significant
E29	635337	160698	0	8	0.02	10.80	0.2%	135.0%	Not significant
E30	633692	159746	0	8	0.02	15.70	0.2%	196.2%	Not significant
E31	634794	159415	0	8	0.02	15.70	0.2%	196.2%	Not significant
E32	635708	159117	0	8	0.01	12.05	0.2%	150.7%	Not significant
E33	633607	158133	0	8	0.01	15.69	0.1%	196.1%	Not significant
E34	635539	157577	0	8	0.01	12.05	0.1%	150.6%	Not significant
E35	633584	156906	0	Not assessed	0.01	15.69	N/A	N/A	Not significant
E36	635214	156105	0	8	0.01	12.05	0.1%	150.6%	Not significant
E37	632347	155607	0	Not assessed	0.01	15.69	N/A	N/A	Not significant
E38	632033	163044	0	Not assessed	0.04	13.48	N/A	N/A	Not significant
E39	632554	162933	0	Not assessed	0.04	13.48	N/A	N/A	Not significant
E40	633412	162328	0	Not assessed	0.03	13.47	N/A	N/A	Not significant
E41	633527	162189	0	Not assessed	0.03	13.47	N/A	N/A	Not significant
E42	632364	162425	0	Not assessed	0.03	13.47	N/A	N/A	Not significant
E43	622112	162206	0	5	0.01	14.29	0.2%	285.8%	Not significant
E44	623126	162989	0	5	0.01	14.29	0.2%	285.8%	Not significant
E45	624052	162872	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	0.01	14.29	N/A	N/A	Not significant
E48	623648	161865	0	5	0.01	14.29	0.2%	285.8%	Not significant
E49	622879	161358	0	5	0.01	14.29	0.2%	285.8%	Not significant
E50	631694	164088	0	20	0.08	12.68	0.4%	63.4%	Not significant
E51	631458	164099	0	20	0.09	12.83	0.4%	64.1%	Not significant
E52	631039	164107	0	20	0.08	12.82	0.4%	64.1%	Not significant
E53	632436	162421	0	20	0.03	12.77	0.1%	63.8%	Not significant
E54	631908	162848	0	20	0.04	13.06	0.2%	65.3%	Not significant
E55	631008	162944	0	20	0.05	10.41	0.2%	52.0%	Not significant
E56	630479	164211	0	10	0.14	17.78	1.4%	177.8%	Not significant
E57	630389	164405	0	10	0.14	17.78	1.4%	177.8%	Not significant
E58	630172	164540	0	10	0.13	18.75	1.3%	187.5%	Not significant
E59	633116	169430	0	10	0.09	18.71	0.9%	187.1%	Not significant
E60	633976	168913	0	10	0.12	18.74	1.2%	187.4%	Not significant
E61	635881	166552	0	10	0.16	18.78	1.6%	187.8%	Not significant
E62	635634	165614	0	10	0.21	18.83	2.1%	188.3%	Not significant
E63	635696	165271	0	10	0.21	22.89	2.1%	228.9%	Not significant
E64	635212	165108	0	10	0.31	22.99	3.1%	229.9%	Not significant
E65	635302	164394	0	10	0.19	22.87	1.9%	228.7%	Not significant
E66	634825	164063	0	10	0.16	22.84	1.6%	228.4%	Not significant

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean nitrogen deposition rates.

				Nitrogen Deposition (kg N ha-1 y-1)					
Receptor n	X(m)	Y(m)	Z(m)	Minimum critical loa	PC (kg N ha	PEC (kg N h	%PC of crit	%PEC of cri	Impact
E67	634369	163647	0	20	0.06	13.22	0.3%	66.1%	Not significant
E68	634218	163399	0	20	0.05	10.83	0.3%	54.2%	Not significant
E69	633122	163264	0	10	0.08	18.56	0.8%	185.6%	Not significant
E70	633581	165056	0	10	0.42	18.90	4.2%	189.0%	Not significant
E71	633420	165112	0	10	0.45	18.93	4.5%	189.3%	Not significant
E72	633441	164876	0	10	0.31	23.27	3.1%	232.7%	Not significant
E73	633330	164922	0	10	0.33	23.29	3.3%	232.9%	Not significant
E74	632062	164071	0	10	0.15	23.11	1.5%	231.1%	Not significant
E75	631267	164655	0	10	0.24	23.20	2.4%	232.0%	Not significant
E76	631135	164551	0	10	0.21	23.17	2.1%	231.7%	Not significant
E77	631149	166159	0	10	0.19	23.15	1.9%	231.5%	Not significant
E78	632034	166274	0	10	0.68	19.16	6.8%	191.6%	Not significant
E79	632106	166329	0	10	0.57	26.47	5.7%	264.7%	Not significant
E80	632102	166377	0	10	0.52	26.42	5.2%	264.2%	Not significant
E81	633049	166413	0	10	0.73	20.05	7.3%	200.5%	Not significant
E82	633119	166478	0	10	0.70	26.60	7.0%	266.0%	Not significant
E83	632891	166706	0	10	0.42	19.74	4.2%	197.4%	Not significant
E84	632763	166769	0	10	0.37	26.27	3.7%	262.7%	Not significant
E85	631105	168000	0	10	0.11	19.43	1.1%	194.3%	Not significant
E86	631260	168095	0	10	0.12	26.02	1.2%	260.2%	Not significant
E87	631603	168434	0	10	0.12	23.08	1.2%	230.8%	Not significant
E88	632016	168303	0	10	0.14	23.10	1.4%	231.0%	Not significant

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean acidity deposition rates.

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

				Acid Deposition (keq ha-1 y-1)									Exceedance			% of CL function			
Receptor n	X(m)	Y(m)	Z(m)	CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC	PC (Exceedance)	Backgroun (Exceedance)	PEC (Exceedance)	PC (% of CL function)	Backgroun (% of CL function)	PEC (% of CL function)	Impact
E01	621048	168683	0	0.88	0.223	1.13	0	0.0003	0.20	0.90	0.2	0.900331	No exceed	No exceed	No exceed	0.0	97.3	97.4	Not significant
E02	625191	169137	0	0.88	0.223	1.13	0	0.0005	0.19	0.91	0.19	0.910509	No exceed	No exceed	No exceed	0.0	97.3	97.4	Not significant
E03	628533	169560	0	0.88	0.223	1.13	0	0.0011	0.19	0.91	0.19	0.911057	No exceed	No exceed	No exceed	0.1	97.3	97.4	Not significant
E04	629867	169917	0	0.88	0.223	1.13	0	0.0016	0.19	0.91	0.19	0.911648	No exceed	No exceed	No exceed	0.1	97.3	97.5	Not significant
E05	630740	169804	0	0.88	0.223	1.13	0	0.0023	0.20	0.93	0.2	0.932298	No exceed	No exceed	0.00	0.2	100.0	100.2	Not significant
E06	631813	170059	0	0.88	0.223	1.13	0	0.0029	0.19	0.74	0.19	0.742883	No exceed	No exceed	No exceed	0.3	82.3	82.6	Not significant
E07	632683	170381	0	0.88	0.223	1.13	0	0.0026	0.19	0.74	0.19	0.742571	No exceed	No exceed	No exceed	0.2	82.3	82.5	Not significant
E08	633993	170521	0	0.88	0.223	1.13	0	0.0026	0.19	0.74	0.19	0.742584	No exceed	No exceed	No exceed	0.2	82.3	82.5	Not significant
E09	635116	170740	0	0.88	0.223	1.13	0	0.0027	0.20	0.77	0.2	0.772688	No exceed	No exceed	No exceed	0.2	85.8	86.1	Not significant
E10	636457	171381	0	0.88	0.223	1.13	0	0.0021	0.20	0.77	0.2	0.772091	No exceed	No exceed	No exceed	0.2	85.8	86.0	Not significant
E11	637964	171321	0	0.88	0.223	1.13	0	0.0017	0.20	0.77	0.2	0.771736	No exceed	No exceed	No exceed	0.2	85.8	86.0	Not significant
E12	639028	171113	0	0.88	0.223	1.13	0	0.0015	0.20	0.77	0.2	0.771473	No exceed	No exceed	No exceed	0.1	85.8	86.0	Not significant
E13	639841	170161	0	0.88	0.223	1.13	0	0.0013	0.20	0.77	0.2	0.771258	No exceed	No exceed	No exceed	0.1	85.8	86.0	Not significant
E14	639882	168631	0	0.88	0.223	1.13	0	0.0012	0.23	0.94	0.23	0.941184	No exceed	0.04	0.04	0.1	103.5	103.6	Not significant
E15	639810	167452	0	0.88	0.223	1.13	0	0.0012	0.23	0.94	0.23	0.941219	No exceed	0.04	0.04	0.1	103.5	103.6	Not significant
E16	639527	166684	0	0.88	0.223	1.13	0	0.0013	0.23	0.94	0.23	0.941332	No exceed	0.04	0.04	0.1	103.5	103.7	Not significant
E17	639241	165688	0	0.88	0.223	1.13	0	0.0016	0.23	0.94	0.23	0.941628	No exceed	0.04	0.04	0.1	103.5	103.7	Not significant
E18	638891	165003	0	Not sensitive	Not sensitive	Not sensitive	0	0.0019	0.23	0.94	0.23	0.941901	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E19	638595	164294	0	Not sensitive	Not sensitive	Not sensitive	0	0.0021	0.21	0.77	0.21	0.77212	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E20	637303	164087	0	0.90	0.223	1.123	0	0.0031	0.21	0.77	0.21	0.773073	No exceed	No exceed	No exceed	0.3	87.3	87.5	Not significant
E21	636318	164194	0	0.90	0.223	1.123	0	0.0043	0.21	0.77	0.21	0.774347	No exceed	No exceed	No exceed	0.4	87.3	87.7	Not significant
E22	635298	164386	0	0.90	0.223	1.123	0	0.0067	0.21	0.77	0.21	0.776701	No exceed	No exceed	No exceed	0.6	87.3	87.9	Not significant
E23	634800	164047	0	0.90	0.223	1.123	0	0.0057	0.20	0.96	0.2	0.965742	No exceed	0.04	0.04	0.5	103.3	103.8	Not significant
E24	634346	163650	0	0.90	0.223	1.123	0	0.0045	0.20	0.96	0.2	0.964518	No exceed	0.04	0.04	0.4	103.3	103.7	Not significant
E25	633796	162733	0	0.88	0.223	1.13	0	0.0025	0.20	0.96	0.2	0.962465	No exceed	0.03	0.03	0.2	102.7	102.9	Not significant
E26	633703	162425	0	0.88	0.223	1.13	0	0.0022	0.20	0.96	0.2	0.962156	No exceed	0.03	0.03	0.2	102.7	102.8	Not significant
E27	634513	161455	0	0.90	0.223	1.123	0	0.0018	0.20	0.96	0.2	0.96183	No exceed	0.04	0.04	0.2	103.3	103.5	Not significant
E28	633502	161188	0	0.90	0.223	1.123	0	0.0014	0.20	0.96	0.2	0.961432	No exceed	0.04	0.04	0.1	103.3	103.4	Not significant
E29	635337	160698	0	0.90	0.223	1.123	0	0.0014	0.21	0.77	0.21	0.771404	No exceed	No exceed	No exceed	0.1	87.3	87.4	Not significant
E30	633692	159746	0	0.90	0.223	1.123	0	0.0011	0.25	1.12	0.25	1.121072	No exceed	0.25	0.25	0.1	122.0	122.1	Not significant
E31	634794	159415	0	0.90	0.223	1.123	0	0.0011	0.25	1.12	0.25	1.12112	No exceed	0.25	0.25	0.1	122.0	122.1	Not significant
E32	635708	159117	0	0.90	0.223	1.123	0	0.0010	0.23	0.86	0.23	0.86098	No exceed	No exceed	No exceed	0.1	97.1	97.1	Not significant
E33	633607	158133	0	0.90	0.223	1.123	0	0.0008	0.25	1.12	0.25	1.120787	No exceed	0.25	0.25	0.1	122.0	122.1	Not significant
E34	635539	157577	0	0.90	0.223	1.123	0	0.0008	0.23	0.86	0.23	0.860783	No exceed	No exceed	No exceed	0.1	97.1	97.1	Not significant
E35	633584	156906	0	0.32	0.248	0.526	0	0.0006	0.25	1.12	0.25	1.120649	No exceed	0.84	0.84	0.1	260.5	260.6	Not significant
E36	635214	156105	0	0.88	0.223	1.13	0	0.0006	0.23	0.86	0.23	0.860648	No exceed	No exceed	No exceed	0.1	96.5	96.5	Not significant
E37	632347	155607	0	0.32	0.248	0.526	0	0.0005	0.25	1.12	0.25	1.120491	No exceed	0.84	0.84	0.1	260.5	260.5	Not significant
E38	632033	163044	0	0.32	0.248	0.526	0	0.0030	0.20	0.96	0.2	0.963021	No exceed	0.63	0.64	0.6	220.5	221.1	Not significant
E39	632554	162933	0	0.32	0.248	0.526	0	0.0026	0.20	0.96	0.2	0.962589	No exceed	0.63	0.64	0.5	220.5	221.0	Not significant
E40	633412	162328	0	0.32	0.248	0.526	0	0.0020	0.20	0.96	0.2	0.961974	No exceed	0.63	0.64	0.4	220.5	220.9	Not significant
E41	633527	162189	0	0.32	0.248	0.526	0	0.0019	0.20	0.96	0.2	0.96192	No exceed	0.63	0.64	0.4	220.5	220.9	Not significant
E42	632364	162425	0	0.32	0.248	0.526	0	0.0021	0.20	0.96	0.2	0.962132	No exceed	0.63	0.64	0.4	220.5	220.9	Not significant
E43	622112	162206	0	0.23	0.321	0.542	0	0.0007	0.22	1.02	0.22	1.020725	No exceed	0.70	0.70	0.1	228.8	228.9	Not significant
E44	623126	162989	0	0.23	0.321	0.542	0	0.0008	0.22	1.02	0.22	1.020844	No exceed	0.70	0.70	0.2	228.8	228.9	Not significant
E45	624052	162872	0	No critical load	No critical load	No critical load	0	0.0010	0.22	1.02	0.22	1.020954	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E46	624096	162621	0	No critical load	No critical load	No critical load	0	0.0010	0.22	1.02	0.22	1.020955	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E47	623938	162268	0	No critical load	No critical load	No critical load	0	0.0009	0.22	1.02	0.22	1.020921	N/A	N/A	N/A	N/A	N/A	N/A	Not significant
E48	623648	161865	0	0.23	0.321	0.542	0	0.0009	0.22	1.02	0.22	1.020867	No exceed	0.70	0.70	0.2	228.8	228.9	Not significant
E49	622879	161358	0	0.23	0.321	0.542	0	0.0008	0.22	1.02	0.22	1.020768	No exceed	0.70	0.70	0.1	228.8	228.9	Not significant
E50	631694	164088	0	3.93	0.85	4.79	0	0.0059	0.20	0.90	0.2	0.90591	No exceed	No exceed	No exceed	0.1	23.0	23.1	Not significant
E51	631458	164099	0	3.93	0.85	4.79	0	0.0062	0.19	0.91	0.19	0.916212	No exceed	No exceed	No exceed	0.1	23.0	23.1	Not significant
E52	631039	164107	0	3.93	0.85	4.79	0	0.0059	0.19	0.91	0.19	0.915901	No exceed	No exceed	No exceed	0.1	23.0	23.1	Not significant
E53	632436	162421	0	3.93	0.85	4.79	0	0.0021	0.19	0.91	0.19	0.912101	No exceed	No exceed	No exceed	0.0	23.0	23.0	Not significant
E54	631908	162848	0	3.93	0.85	4.79	0	0.0028	0.20	0.93	0.2	0.932848	No exceed	No exceed	No exceed	0.1	23.6	23.7	Not significant
E55	631008	162944	0	3.93	0.85	4.79	0	0.0035	0.19	0.74	0.19	0.743495	No exceed	No exceed	No exceed	0.0	4.8	4.8	Not significant
E56	630479	164211	0	1.77	0.14	1.91	0	0.0098	0.23	1.26	0.23	1.269783	No exceed	No exceed	No exceed	0.5	78.0	78.5	Not significant
E57	630389	164405	0	1.77	0.14	1.91	0	0.0099	0.23	1.26	0.23	1.269897	No exceed	No exceed	No exceed	0.5	78.0	78.5	Not significant
E58	630172	164540	0	1.77	0.14	1.91	0	0.0092	0.24	1.33	0.24	1.339172	No exceed	No exceed	No exceed	0.5	82.2	82.7	Not significant
E59	633116	169430	0	1.67	0.14	1.81	0	0.0067	0.24	1.33	0.24	1.336714	No exceed	No exceed	No exceed	0.4	86.7	87.1	Not significant
E60	633976	168913	0	10.81	0.14	10.96	0	0.0089	0.24	1.33	0.24	1.338854	No exceed	No exceed	No exceed	0.1	14.3	14.4	Not significant
E61	635881	166552	0	1.68	0.14	1.82	0	0.0115	0.24	1.33	0.24	1.34153	No exceed	No exceed	No exceed	0.6	86.3	86.9	Not significant
E62	635634	165614	0	10.83	0.14	10.97	0	0.0150	0.24	1.33	0.24	1.344976	No exceed	No exceed	No exceed	0.1	14.3	14.4	Not significant
E63	635696	165271	0	10.83	0.14	10.97	0	0.0149	0.28	1.62	0.28	1.634868	No exceed	No exceed	No exceed	0.1	17.3	17.5	Not significant
E64	635212	165108	0	10.83	0.14	10.97	0	0.0221	0.28	1.62	0.28	1.642075	No exceed	No exceed	No exceed	0.2	17.3	17.5	Not significant
E65	635302	164394	0	1.72	0.14	1.86	0	0.0135	0.28	1.62	0.28	1.633466	No exceed	0.04	0.05	0.7	102.2	102.9	Not significant
E66	634825	164063	0	1.77	0.14	1.91	0	0.0115	0.28	1.62	0.28	1.63153	No exceed	No exceed	0.00	0.6	99.5	100.1	Not significant
E67	634369	163647	0	3.93	0.85	4.79	0	0.0045	0.23	0.94	0.23	0.944533	No exceed	No exceed	No exceed	0.1	24.4	24.5	Not significant
E68	634218	163399	0	3.93	0.85	4.79	0	0.0038	0.21	0.77	0.21	0.773767	No exceed	No exceed	No exceed	0.0	5.3	5.3	Not significant
E69	633122	163264	0	1.77	0.14	1.92	0	0.0058	0.26	1.32	0.26	1.325813	No exceed	No exceed	No exceed	0.3	82.3	82.6	Not significant
E70	633581	165056	0	10.83	0.14	10.97	0	0.0299	0.26	1.32	0.26	1.349888	No exceed	No exceed	No exceed	0.3	14.4	14.7	Not significant
E71	633420	165112	0	10.83	0.14	10.97	0	0.0322	0.26	1.32	0.26	1.352218	No exceed	No exceed	No exceed	0.3	14.4	14.7	Not significant
E72	633441	164876	0	1.77	0.14	1.92	0	0.0223	0.24	1.64	0.24	1.662259	No exceed	No exceed	No exceed	1.2	97.9	99.1	Not significant
E73	633330	164922	0	1.77	0.14	1.92	0	0.0237	0.24	1.64	0.24	1.663692	No exceed	No exceed	No exceed	1.2	97.9	99.2	Not significant
E74	632062	164071	0	1.77	0.14	1.92	0	0.0105	0.24	1.64	0.24	1.650483	No exceed	No exceed	No exceed	0.5	97.9	98.5	Not significant

Year 20. Concentrations from airport operation and road traffic (there is no construction activity in this year).
Annual mean acidity deposition rates.

				Acid Deposition (keq ha-1 y-1)								
Receptor n	X(m)	Y(m)	Z(m)	CLmaxS	CLminN	CLmaxN	S PC	N PC	S back-ground	N back-ground	S PEC	N PEC
E75	631267	164655	0	1.77	0.14	1.91	0	0.0171	0.24	1.64	0.24	1.657132
E76	631135	164551	0	1.77	0.14	1.91	0	0.0152	0.24	1.64	0.24	1.655167
E77	631149	166159	0	1.68	0.14	1.82	0	0.0138	0.24	1.64	0.24	1.653824
E78	632034	166274	0	10.82	0.14	10.97	0	0.0485	0.26	1.32	0.26	1.368457
E79	632106	166329	0	10.82	0.14	10.97	0	0.0407	0.29	1.85	0.29	1.890666
E80	632102	166377	0	10.82	0.14	10.97	0	0.0372	0.29	1.85	0.29	1.88722
E81	633049	166413	0	10.82	0.14	10.97	0	0.0519	0.27	1.38	0.27	1.431926
E82	633119	166478	0	10.82	0.14	10.97	0	0.0501	0.29	1.85	0.29	1.900051
E83	632891	166706	0	10.82	0.14	10.97	0	0.0301	0.27	1.38	0.27	1.41015
E84	632763	166769	0	10.82	0.14	10.97	0	0.0263	0.29	1.85	0.29	1.876348
E85	631105	168000	0	1.67	0.14	1.81	0	0.0078	0.27	1.38	0.27	1.387756
E86	631260	168095	0	1.67	0.14	1.81	0	0.0083	0.29	1.85	0.29	1.858282
E87	631603	168434	0	1.67	0.14	1.81	0	0.0088	0.24	1.64	0.24	1.648803
E88	632016	168303	0	1.67	0.14	1.81	0	0.0101	0.24	1.64	0.24	1.650136

Formulas based on apis.ac.uk description. Does not include rounding of the PCs/PECs, so may be slightly different from results from the APIS website.

Exceedance			% of CL function			
PC	Backgroun	PEC	PC	Backgroun	PEC	Impact
No exceed	No exceed	No exceed	0.9	98.4	99.3	Not significant
No exceed	No exceed	No exceed	0.8	98.4	99.2	Not significant
No exceed	0.06	0.07	0.8	103.3	104.1	Not significant
No exceed	No exceed	No exceed	0.4	14.4	14.8	Not significant
No exceed	No exceed	No exceed	0.4	19.5	19.9	Not significant
No exceed	No exceed	No exceed	0.3	19.5	19.8	Not significant
No exceed	No exceed	No exceed	0.5	15.0	15.5	Not significant
No exceed	No exceed	No exceed	0.5	19.5	20.0	Not significant
No exceed	No exceed	No exceed	0.3	15.0	15.3	Not significant
No exceed	No exceed	No exceed	0.2	19.5	19.7	Not significant
No exceed	No exceed	No exceed	0.4	91.2	91.6	Not significant
No exceed	0.33	0.34	0.5	118.2	118.7	Not significant
No exceed	0.07	0.08	0.5	103.9	104.4	Not significant
No exceed	0.07	0.08	0.6	103.9	104.4	Not significant

RiverOak Strategic Partners Limited

Manston Airport

Report to Inform the Appropriate Assessment

July 2018

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

RiverOak Strategic Partners

Main contributors

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Document revisions

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1	Draft	09/10/2017
2	Draft (version 2)	04/01/2018
3	Draft (version 3)	16/02/2018
4	Final	March 2018
5	Final Issue 2	July 2018

Contents

1. Introduction

1.1 Background to and Purpose of this Report

1.1.1.1 This Report forms one of a suite of documents, which together support and explain in detail the content and nature of RiverOak Strategic Partners (hereafter referred to as 'RiverOak') Development Consent Order (DCO) application in respect of the Manston Airport Project (the 'Proposed Development'); the proposals and their policy context are more fully described in the Planning Statement (Environment Statement [ES] **Chapter 4: Planning Policy Context**) and related supporting documentation accompanying the DCO application. The description for the Proposed Development is provided in **ES Chapter 3: Description of the Proposed Development.** This report is an appendix **(Appendix 7.1)** to **ES Chapter 7: Biodiversity.**

1.1.1.2 RiverOak is seeking a DCO (incorporating powers of compulsory acquisition of interests and rights in land) to acquire, re-develop and re-open Manston Airport in Ramsgate, Kent. The proposal focuses on the provision of air cargo services. The proposal also includes the provision of passenger services and enable aircraft maintenance, repair, overhaul and end-of-life recycling amongst other things.

1.1.1.3 The project is a Nationally Significant Infrastructure Project (NSIP) under section14 (1)(i) and section23 of the *Planning Act 2008 (as amended)* (hereafter referred to as the 2008 Act). Development consent under the 2008 Act is required if a development is an NSIP. An application for a DCO will be examined by the Planning Inspectorate (PINS) who will make a recommendation to the Secretary of State for Transport as to whether the DCO is granted. The Secretary of State will then decide whether the DCO is made.

1.1.1.4 When considering the merits of the application, the Secretary of State and PINS must consider potential effects on European sites (Natura 2000 sites[1]). European sites are defined as Special Areas of Conservation (SACs), candidate SACs, Sites of Community Importance (SCI), Special Protection Areas (SPA) and European Marine Sites, which are marine areas designated as SACs and SPAs. UK policy extends the requirements pertaining to European sites to include Ramsar sites and potential SPAs, which would include proposed extensions or alterations to existing SPAs.

1.1.1.5 SPAs are sites classified in accordance with *Article 4 of Directive 2009/147/EC on the conservation of wild birds*, the codified version of *Directive 79/409/EEC as amended*. This is known as the Birds Directive.

1.1.1.6 SACs are designated under *Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*, as amended. This is known as the Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II respectively of the Habitats Directive.

1.1.1.7 The term 'European Marine Site' (EMS) (as defined by the *Conservation of Habitats and Species Regulations 2017, as amended* (SI 2017 No. 1012) and also known as the 'Habitats Regulations') refers to those marine areas of both SACs and SPAs, which are protected under the EC Habitats and Birds Directives. These areas range from entirely subtidal to exclusively intertidal. An EMS can be an entire SAC or SPA, or only part of one (the SAC/SPA may also include terrestrial areas). However, 'European Marine Site' is not a statutory site designation: these areas are essentially management units for those parts of Natura 2000 sites which extend beyond the SSSI designations in the UK.

1.1.1.8 SCIs are sites that have been adopted by the European Commission but not yet formally designated by the government of each country. Article 13(1) of the Habitats Regulations state that:

[1] Natura 2000 is a network of nature protection areas in the territory of the European Union.

> "*Once a site of Community importance in England or Wales has been adopted in accordance with the procedure laid down in Article 4(2) of the Habitats Directive (list of sites of Community importance), the appropriate authority must designate that site as a special area of conservation as soon as possible and no later than six years from the date of adoption of that site.*"

1.1.1.9 Ramsar sites are wetlands of international importance, listed under the *Ramsar Convention*, which the UK ratified in 1976. The vast majority of Ramsar sites are also designated as a SPA. Though Ramsar sites are international / global sites, because of the UK national policy requirement to treat them as Natura 2000 sites, they are also referred to as 'European sites' within this document.

1.1.1.10 If a project is likely to have an effect on a European site, the applicant must provide a Habitats Regulations Assessment (HRA) report as part of the application documentation. The HRA report must show the European site(s) potentially affected, alongside sufficient information to enable the Secretary of State to make an appropriate assessment[2] if required.

1.2 Habitats Regulations Assessment

1.2.1.1 The Habitats Directive provides, *inter alia*, a framework for the protection of European sites. The Habitats Directive is transposed into the law of England and Wales by The *Conservation of Habitats and Species Regulations 2017, as amended* (SI 2017 No. 1012) and also known as the 'Habitats Regulations'.

1.2.1.2 Amongst other things, the Habitats Regulations define the process for the assessment of the implications of plans or projects on European sites. This process is termed the Habitats Regulations Assessment (HRA) and, in relation to Nationally Significant Infrastructure Projects (NSIPs), is specified by the Planning Inspectorate in its advice note entitled '*Habitats Regulations Assessment relevant to National Infrastructure Projects (Advice Note 10)*' (Version 8, November 2017). Further guidance on the HRA process is available at both the national[3] and European level[4].

1.2.1.3 In exercising its duty as Competent Authority, the Secretary of State must comply with Regulation 63 of the Habitats Regulations, as set out below:

- "*63(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which:*
  - *a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and*
  - *b) is not directly connected with or necessary to the management of that site,*
- *must make an appropriate assessment of the implications for that site in view of that site's conservation objectives*."

1.2.1.4 In undertaking the assessment under Regulation 63(1)(a) and, if required the appropriate assessment under Regulation 63(1)(b), the Secretary of State must consult Natural England and have regard to any representations that Natural England makes. The HRA is a staged process that is described in Advice Note 10 as:

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[2] Regulation 5 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.
[3] ODPM Circular 06/2005: Biodiversity and Geological Conservation – statutory obligations and their impact within the planning system
[4] European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC; European Commission (2000) Managing Natura 2000 Sites – the Provisions of Article 6 of Article 6 of the "Habitats" Directive 92/43/EEC.

- **Stage 1** – HRA Screening: Screening for Likely Significant Effects (LSEs or an LSE). If there are no LSE(s) identified for all the European sites considered, then the report should take the form of a No Significant Effects Report (NSER) and HRA Stages 2-4 will not be required.
- **Stage 2** - Appropriate Assessment: If there are LSEs, it is necessary to assess the implications of those LSEs on the affected site's or sites' conservation objectives.
- **Stage 3** - Assessment of Alternatives: A consideration of alternatives is required if it cannot be concluded that there will be no adverse effect on the integrity of the affected European site(s).
- **Stage 4** - Consideration of Imperative Reasons of Over-riding Public Important (IROPI): If there are no alternatives, an IROPI assessment is required.

1.2.1.5 Stages 1 and 2 are covered by Regulation 63 (as stated above), and Stages 3 and 4 are covered by Regulation 64 of the Habitats Regulations.

1.2.1.6 This document has been produced because the Proposed Development is located in close proximity to several European sites, notably the Thanet Coast and Sandwich Bay Special Protection Area (SPA) and Ramsar, and the Sandwich Bay Special Area of Conservation (SAC). It describes the methods employed (in **Section 2**) and results (in **Section 3**) of the HRA screening process (i.e. Stage 1), undertaken in connection with the Proposed Development, which has been informed through the consultation process. A number of LSEs are identified from the screening process, and taken forward for more detailed consideration in this report to inform an Appropriate Assessment (Stage 2), the details of which are also provided within this report (in **Section 4**), and concluded in **Section 5**.

1.3 Consultation

1.3.1.1 A consultation exercise has been undertaken with Natural England prior to the ES being issued to PINS for determination, to inform the HRA screening exercise (Stage 1) and provide input to inform the Appropriate Assessment (Stage 2). **Table 1.1** provides an overview of the meetings undertaken with Natural England.

Table 1.1 HRA Consultation

Date	Type / Participants	Meeting Scope
26/04/2016	Meeting - Natural England and Amec Foster Wheeler Environment & Infrastructure UK Limited (Amec Foster Wheeler)	Project outline; general overview of biodiversity issues including European sites; potential scope of the Evidence Plan process.
03/11/2016	Meeting - Natural England and Amec Foster Wheeler	Project update; use of third party data; HRA Screening Methodology; ornithological survey; assessment parameters.
05/09/2017	Meeting - Natural England and Amec Foster Wheeler	Project update, baseline survey programme, HRA (air quality, Water, noise issues) and European Protected Species; ornithological survey (bird flight line survey).
06/03/2018	Meeting - Natural England and Wood (previously Amec Foster Wheeler)	Project update, bat survey and European Protected Species licencing, HRA (noise in relation to effects on birds, air quality and water).

2. Methodology

2.1 HRA Screening (Stage 1)

2.1.1 Process Outline

2.1.1.1 It is the purpose of the HRA screening stage (Stage 1) to determine whether or not a plan or project is capable of resulting in LSEs on one or more European sites. If a LSE is identified, an Appropriate Assessment is required (Stage 2) to determine whether it can be concluded that the plan or project will not result in an adverse effect on the integrity of one or more European sites.

2.1.1.2 The HRA screening stage has been characterised by the European Commission in the guidance document '*Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*' as a four-step process. These steps are:

- **Step 1***: "determining whether the project or plan is directly connected with or necessary to the management of the* European *site";*
- **Step 2***: "describing the project or plan and the description and characterisation of other projects or plans that in combination have the potential for having significant effects on the Natura 2000 site";*
- **Step 3***: "identifying the potential adverse effects on the European site";* and
- **Step 4:** "*assessing the significance of any adverse effects on the European site".*

2.1.1.3 The originator of the plan or project must provide sufficient information to the Competent Authority to enable LSEs to be identified, and if they are, to inform an Appropriate Assessment. The Appropriate Assessment is then carried out by the Competent Authority.

2.1.1.4 In order to determine whether a plan or project is capable of resulting in one or more LSEs on a European site, it is necessary to understand the activities associated with the construction, operation or decommissioning (if relevant) of the project (e.g. the take-off / landing of aircraft), the potential changes that may occur in the environment as a result (e.g. the production of aircraft noise and pollution) and the effects that this may have on designated features of European sites (e.g. disturbance of fauna resulting in increased energy expenditure and reduced energy intake resulting in lower survival and productivity rates). Through the use of this 'activity – change – effect' concept, it is possible to identify potential European sites (and their designated features) that may be subject to LSEs through the determination of a series of geographic parameters (see **Section 2.3**).

2.1.1.5 When each of the four steps has been worked through, there are two potential outcomes:

- One or more LSEs on designated features of European sites are identified and the project requires an Appropriate Assessment (Stage 2); or
- No LSEs on designated features of European sites are identified, either because there is no pathway by which such effects could occur or the potential effect can be discounted due to project design (see **Section 2.4**) and therefore, there is no requirement for an Appropriate Assessment.

2.1.2 Identifying In-Combination Effects, and Other Plans or Projects for Inclusion (Step 2, Stage 1)

2.1.2.1 Effects on European sites may result from a proposed development alone and/or in-conjunction with other plans or projects; these potential effects are described as 'in-combination effects' in the Habitats Regulations. Within the published literature, the main reference that provides relevant and current guidance is:

- *Planning Inspectorate [PINS] (2015). Advice Note 17 Cumulative Effects Assessment relevant to nationally significant infrastructure projects*.

2.1.2.2 This source informed the methods used for the separate in-combination assessment.

2.1.2.3 The identification of plans and projects to include within the in-combination assessment of effects, forms part of **Step 2** of the HRA screening process, and follows the same methodology as that outlined in **Section 2.1.3** for the identification of European sites relevant to the Proposed Development. Key to the inclusion of other plans and projects within the in-combination assessment are the spatial and temporal overlaps that may occur due to the scale of potential changes (e.g. overlaps in the zones of disturbance caused by simultaneous construction activity) or the areas over which potential receptors may travel (e.g. a bird may pass through several areas where development is proposed when moving between roosting and feeding grounds).

2.1.2.4 The same process for undertaking an Environmental Impact Assessment (EIA) Cumulative Effects Assessment (CEA) for a Nationally Significant Infrastructure Project (NSIP) as outlined in PINS Advice Note 17 (PINS, 2017) has been used for the HRA in-combination assessment.

2.1.2.5 Details of the approach taken in assessing in-combination effects, referred to as the cumulative impacts within the ES, is provided in **ES Chapter 5: Approach to the Environmental Statement** and in **Chapter 18: Cumulative Effects**. The outcome of this process, is a short-list of other developments and plans to include within the in-combination assessment.

2.1.3 Identification of the European Sites that Could Be Affected by the Proposed Development and Other Plans/Projects (Step 3, Stage 1)

2.1.3.1 Part of **Step 3** of the HRA screening stage is to identify the European sites that could potentially be affected by the Proposed Development, either alone and/or in-conjunction with other plans or projects. The European sites that should be considered within the HRA screening process are those where there is the potential for an effect to be realised. Key to determining which European sites are included is an understanding of the activities associated with the Proposed Development, the geographical scale over which changes due to the different activities may be detectable and the types of receptors (i.e. designated features) susceptible to them. An efficient way to determine these relationships in a structured and transparent way is through the use of the activity – change – effect model, which has been employed within this screening process.

2.1.3.2 Central to the identification of European sites for consideration within the HRA process is the ability to define evidence based geographic parameters. In order to achieve this, the following steps are followed (see **Table 3.1** for further detail):

- Identification of the activities of the Proposed Development and other plans/projects associated with the construction, operation or (if applicable) decommissioning phases that have the potential to result in changes to background environmental parameters (e.g. air quality, land take);
- Determination of the changes that could occur as a result of the activities identified;
- Determination of the scale over which these changes may occur, based on published literature, outputs from the ecological assessment process and/or professional judgement; and
- Identification of the potential receptors[5] (e.g. based on Annex 1 habitats and Annex II species in the Habitats Directive and Annex I birds listed in the Birds Directive, including any functionally linked habitat outside the boundaries of the SPA) that may be affected by the identified changes.

2.1.3.3 Functionally linked habitat in this context is defined as: Areas of land or sea outside of the boundary of a European site that may be important ecologically in supporting the populations for which the European site has been designated or classified. Occasionally impacts to such habitats

[5] Based on baseline environmental survey and desk-study information.

can have a significant effect upon the species interest of such sites, where these habitats are considered to be functionally linked to the site (Natural England, 2016).

2.1.3.4 The outcome of these steps is a series of geographic parameters based on potential pathways of effect that can then be used to determine both the European sites for inclusion within the HRA process due to their physical proximity to the Proposed Development, and those linked by way of mobile fauna and associated functionally linked habitat.

2.1.3.5 Information on European sites within the UK was gathered using the Joint Nature Conservation Committee (JNCC) website (www.jncc.gov.uk)[6] and the Defra GIS[7] mapping tool MAGIC (http://magic.defra.gov.uk/). Data on designations elsewhere within the European Union was available from the European Environment Agency's Natura 2000 network viewer (http://natura2000.eea.europa.eu/), in order to determine any potential transboundary impacts.

2.1.4 Determining LSEs (Step 4, Stage 1)

2.1.4.1 Step 4 of the HRA screening process is to assess the significance of any adverse effects on the European sites identified in **Step 3**. The HRA screening process uses the LSE threshold to determine whether effects on European sites should be the subject of further assessment. The Habitats Regulations do not define the term LSE. However, in the Waddenzee case (Case C-127/02), the European Court of Justice found that an LSE exists if it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the conservation objectives of the site concerned, whether alone or in-combination with any other project. The Advocate General's opinion in relation to the Sweetman case (Case C-258/11) further clarifies the position by noting that, for a conclusion that an LSE exists to be made "*there is no need to **establish** such an effect, it is merely necessary to determine that there **may** be such an effect*" (bold font indicates original emphasis).

2.1.4.2 For the purposes of the screening stage, an LSE is defined as any identified effect that is capable of resulting in a change in the conservation status of one or more qualification features of a European site after all aspects of the plan or project have been considered alone and in-combination with other plans and projects.

2.1.4.3 In line with guidance and case law, a precautionary approach has been taken to the screening process. Only those qualification features and European sites where it can be demonstrated that there is no likelihood of a significant effect occurring have been screened out.

2.1.4.4 Within this screening assessment, each potential effect is considered using information from surveys undertaken as part of:

- The EIA process;
- Published literature (where available); and
- Other available baseline data, modelling outputs and professional judgement (informed by CIEEM, 2016).

2.1.4.5 Where a potential effect has been identified but no LSE is predicted, the reason for that finding is provided.

2.1.4.6 If the screening exercise (**Stage 1**) concludes that no LSEs are predicted, then a 'Non-Significant Effects Report' is produced and no further assessment is undertaken.

[6] Designated features described within the results sections are those outlined in the SPA Review (Stroud *et al.* 2001) as per JNCC guidance (http://jncc.defra.gov.uk/page-5485)
[7] Geographic Information System

2.2 Appropriate Assessment (Stage 2)

2.2.1.1 For those European sites and their features for which LSE(s) has been identified in the Stage 1 screening process, further study is undertaken to permit an Appropriate Assessment (Stage 2) to be undertaken by the Competent Authority, using information provided by the applicant and its consultants and NE. This study includes a detailed assessment of the potential adverse effects on each feature identified, and concludes whether this would result in an adverse effect on the integrity of the European site.

2.2.1.2 The study to provide information for Appropriate Assessment is informed by results from the desk study (to provide contextual information) and baseline surveys undertaken for the Proposed Development, and through consultation with NE. The Favourable Conservation Status (FCS) of the qualifying features of the European sites, the current site conditions and any threats or vulnerabilities are also taken into consideration when assessing the effects as well as any mitigation and avoidance measures aimed at reducing/ avoiding the effects.

2.2.1.3 This follows the approach endorsed in the case of Peter Sweetman v Coillte Teoranta. (Judgement of 12 April 2018, C-323/17). The Judgement concerns the stage at which mitigation measures should be taken into account when undertaking an assessment under the Habitats Regulations. The High Court held that mitigation and avoidance measures should not be considered during Stage 1 (the screening stage during which LSEs are identified) and instead be considered during Stage 2 (Appropriate Assessment).

2.2.1.4 The Habitats Directive defines when the conservation status of the habitats and species it lists is to be considered as favourable. The definitions it uses for this are specific to the Directive; in summary, they require that the range and areas of the listed habitats, and the range and population of the listed species, should be at least maintained at their status when the Directive came into force in 1994 or, where the 1994 status was not viable in the long term, to be restored to a position where it would be viable (http://jncc.defra.gov.uk/page-4096, accessed 6 March 2018).

2.2.1.5 When assessing the conservation status of habitats, four parameters are considered. These are: range, area, structure and function (referred to as habitat condition) and future prospects. For species, the parameters are: range, population, habitat (extent and condition) and future prospects. Each of these parameters is assessed as being in one of the following conditions: Favourable, Unfavourable-inadequate, Unfavourable-Bad, or Unknown.

2.2.1.6 Details of the conservation status (including any pressures and threats) of each qualifying feature is reported in JNCC (2007) and can be obtained from the JNCC website: for habitats (http://jncc.defra.gov.uk/page-4064) and species (http://jncc.defra.gov.uk/page-4063).

2.2.1.7 If it cannot be concluded that there will be no adverse effect on the integrity of the affected European site(s), then **Stage 3** (Assessment of Alternatives) and **Stage 4** (Consideration of Imperative Reasons of Over-riding Public Important) are carried out.

3. HRA Screening (Stage 1)

3.1 Step 1: Relationship Between the Proposed Development and the Conservation Management of European Sites

3.1.1.1 **Step 1** seeks to determine whether or not the plan or project is directly connected or necessary for the management of a European site.

3.1.1.2 The European Commission guidance states that in order to conclude that a plan or project is directly connected or necessary for the management of a European site, it must relate solely to conservation actions and not be a direct or indirect consequence of other actions.

3.1.1.3 The Proposed Development is not connected to, or necessary for, the management of any European site, therefore it is necessary to proceed to **Step 2** (see **Section 3.2**).

3.2 Step 2: Description of the Proposed Development

3.2.1 Description of the Site and the Surrounding Area

The application site

3.2.1.1 The application site (referred to in this document as the Order Limits) is located on the existing site of the former Manston Airport, west of the village of Manston and north east of the village of Minster, in Kent. The town of Margate lies approximately 5km to the north of the Order Limits and Ramsgate approximately 1km to the east/ north-east. Pegwell Bay is located approximately 1km from the operational part of the airport, though the outfall (which, together with the outfall corridor, forms part of the Order Limits) discharges into Pegwell Bay. The northern part of the Order Limits is bisected by the B2050 (Manston Road), and the Order Limits is bounded by the A299 dual carriageway to the south and the B2190 (Spitfire Way) to the west. The existing access to the Order Limits is from the junction of the B2050 with the B2190.

3.2.1.2 The Order Limits covers an area of approximately 303.2 ha (749.2 acres) and comprises a combination of existing buildings and hardstanding, large expanses of grassland, and some limited areas of scrub and/or landscaping and the route of the existing outfall which flows into Pegwell Bay. This includes the 2,748m long, 60m wide runway, which is orientated in an east-west direction across the southern part of the Order Limits. The existing buildings are clustered along the east and northwest boundaries of the Order Limits

3.2.1.3 A network of hard surfacing, used for taxiways, aprons, passenger car parking, and roads connects the buildings to the runway and to the two main airport entrance points that are located to the east and west of the Order Limits. The buildings and facilities are generally surrounded by grassland; during the previous operation of the airport this was kept closely mown. Landscape planting is limited to lines of ornamental trees and shrubs along some sections of the boundary of the Order Limits such as the B2190, around some buildings and in car parking areas on the eastern edge. Post and wire security fencing of varying heights runs alongside most of the Order Limits' perimeter.

3.2.1.4 The part of the Order Limits to the north of Manston Road (B2050), which bisects the centre of the Order Limits in a roughly east to west direction, is referred to as the 'Northern Grass'. This part of the Order Limits is predominantly grassland, with some areas of hard standing, including a stretch of taxiway that formerly linked across to the main taxiway network. The two museums, the Spitfire and Hurricane Memorial Museum, and the RAF Manston Museum, are located in the southwestern corner of the 'Northern Grass'. A small number of other redundant buildings, such as the former RAF air traffic control tower, are also located on the 'Northern Grass'.

Site history

3.2.1.5 The Order Limits provided a variety of airport-related services from 1916 until it ceased operation in May 2014. It operated as RAF Manston until 1998, and was also a base for the United States Air Force for a period in the 1950s. From 1998 it 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. More recently it operated as a specialist air freight and cargo hub. Much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities, and a passenger terminal still remains, with a number of the buildings still in use, including a helicopter pilot training centre, and the Spitfire and Hurricane and RAF Manston museums.

3.2.2 Summary Description of the Proposed Development

3.2.2.1 The aims and purpose 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. The proposed DCO will, amongst other things, authorise:

- Upgrading the runway and improving the parallel taxiway;
- Constructing 19 new air cargo stands;
- Constructing four new passenger aircraft stands and a new passenger terminal;
- Completely re-fitting the airfield navigation aids;
- Refurbishing or replacing the existing fire station;
- Building new air cargo facilities;
- Developing a new air traffic control service, demolishing the current Air Traffic Control tower;
- An aircraft recycling facility;
- A flight training school;
- A fixed-base operation for executive travel;
- Building new aircraft maintenance hangars and developing areas of the ‘Northern Grass’ for airport related businesses; and
- Highway improvement works to ensure improved access to and around Manston Airport, including a new, permanent, dedicated access on Spitfire Way which will help to reduce airport related traffic on the local road network.

3.2.2.2 A detailed description of the Proposed Development is provided in the **Chapter 3: Description of the Proposed Development** within the ES.

3.2.3 DCO Programme and Project Delivery

3.2.3.1 The submission of the DCO application is scheduled for the beginning of the second quarter of 2018. Based on this programme and the anticipated determination period, the DCO may be granted in the third quarter of 2019 and this timescale has been assumed when developing the construction/operational programme for this assessment.

3.2.3.2 The forecasting of the air freight and passenger movements for the airport, as discussed further below, has been conducted for the 20-year period from the granting of the DCO. This section outlines the programme for construction and then operation of the Proposed Development during this 20-year period.

3.2.3.3 The main activities to be undertaken during year 1 would be the construction activities required to return the Order Limits to full operational use. There may be some limited airport services, for example helicopter and heli-charter services, flight school and training services, and fixed base of operation services; however, these will be dependent on the level of work required to restore the runway and to construct other essential services and utilities.

3.2.3.4 The full reopening of the airport would therefore take place in year 2, which would also see the start of the air freight services. Passenger services are anticipated to start in year 5.

3.2.3.5 Three further phases of construction, as described in more detail below, would follow in years 2-5, 5-12 and 12-18. During these three phases of construction, the airport would remain operational (see **Section 3.3, Chapter 3: Description of the Proposed Development** of the ES).

3.2.4 Other Developments and Plans

3.2.4.1 The short list of other developments and plans that has identified for which in-combination effects with the Proposed Development could potentially occur is presented in **Table 18.2** in **Chapter 18: Cumulative Effects** of the ES. The reasons for inclusion and exclusion of 'other developments', are included in **Appendix 18.1, Chapter 18: Cumulative Effects**. The location of the short list of 'other developments' is included in **Figure 18.1**.

3.2.4.2 Of these, 13 developments and 9 plans are wholly or primarily associated with new residential property, with the remaining developments including an offshore wind farm, overhead electricity transmission, road improvement and other non-residential developments.

3.2.4.3 The developments and plans involving the construction of new residential housing have the potential to result in additional disturbance to features of European sites (in particular, golden plover and turnstone) due to increased human visitor pressure to areas that these species utilise for foraging and roosting (e.g. coastal habitats and farmland).

3.2.4.4 There is also the potential for onshore works (such as cable-laying) for the proposed offshore wind farm extension to disturb turnstone and golden plover foraging and roosting on Pegwell Bay.

3.2.4.5 Construction and operation of the developments and plans also have the potential to effect features of European sites due to increased nitrogen deposition from vehicles, pollution from surface water runoff from the sites, and increased disturbance due to the visual presence of operatives and noise from vehicles and machinery.

3.3 Step 3: Identification of Potential Effects on European Sites from the Proposed Development and Other Developments and Plans

3.3.1 Scope of Screening Principles

3.3.1.1 In **Step 3**, the European sites that could be affected by the construction and operation of the Proposed Development, either alone or in-combination with other developments and plans, are identified. The following sections of this report outline the discussions and consultation which took place with interested parties (including PINS, NE, Kent County Council (KCC) and Minster Parish Council) to identify the potential effects of the Proposed Development on sensitive qualifying features (see **Appendix C**). The outcome of this HRA Screening stage is a list of SPAs, SACs, and Ramsar sites and associated qualifying features for which the potential for LSEs to arise (as a result of works associated with the Proposed Development) cannot be excluded.

3.3.1.2 In line with the ruling of the European Court of Justice in Waddenzee (c-127/02), an LSE is one which cannot be excluded on the basis of objective information, either individually or in-combination with other developments and plans.

3.3.1.3 In order to undertake a robust assessment, it has been essential to determine the functional linkages between qualification species, the Proposed Development, and relevant European sites. For wintering birds, for example, these linkages were determined based on dispersal from roost sites, an understanding of foraging range and movement between inland foraging sites and low tide roost sites.

3.3.2 European Sites Included for Assessment

3.3.2.1 Each European site is designated as a SAC, classified as an SPA, or listed as a Ramsar site in respect of specific 'qualifying features'. These 'qualifying features' (habitats, mosaics of habitats, species or assemblage of species, and combinations of these) are the reasons for which the site is to be protected and managed for conservation purposes. All receptors that are qualifying features of European sites or support such features, and which may potentially be affected by the Proposed Development and other developments and plans have been considered within this Screening process, as follows:

3.3.2.2 For SPAs, the qualifying features are the birds for which the SPA is classified, under either:

- *Article 4(1) of the Birds Directive* as rare and vulnerable species, species in danger of extinction or requiring particular attention because of their habitat needs, listed in Annex 1; or
- *Article 4(2) of the Birds Directive* as regularly occurring migratory species (e.g. on passage or over-wintering or an internationally important assemblage of birds) not listed in Annex 1.

3.3.2.3 All UK SPAs were reviewed in 2001 and 2016 by the UK government and numerous changes were made to their designated species. These are detailed on the JNCC website (http://jncc.defra.gov.uk/page-2545) and in published literature (Stroud *et al*. 2001, 2016). As a result of the 2001 review, golden plover and little tern no longer appear as qualifying features of the Thanet Coast and Sandwich Bay SPA. However, these changes have yet to be ratified and therefore, this is understood to mean that until such ratification, the old qualifying features as detailed in the most recent 2012 SPA Conservation Objectives, should be referenced until these SPAs are formally (re) designated.

3.3.2.4 For Ramsar sites, nine 'Criteria' are used to identify wetlands of international importance, these being based on the site supporting rare wetland habitat types (Criteria 1) or specific species or ecological communities (Criteria 2-9 inclusive).

3.3.2.5 For SACs, the qualifying features are the habitats listed in *Annex I of the Habitats Directive* and the species listed in *Annex II of the Habitats Directive*. The JNCC provides citations of SACs, indicating qualifying features (habitats and/or species) that are a primary reason for selection of the site, and those which are present as a qualifying feature, but not a primary reason for site selection. However, for the purposes of this assessment, and as indicated on the JNCC site selection webpage for each SAC, all the qualifying features (both primary and non-primary) need to be treated equally.

3.3.2.6 A 15km radius (from the perimeter of the Order Limits) was used as the initial search area and potential Zone of Influence (ZoI) for the Proposed Development. This initial search area took into consideration the potential aircraft flight paths and the environmental changes and effects (such as air quality) by which the European sites could be affected, such as disturbance from construction and operations on-site, and pollution derived from aircraft entering and leaving the airfield. It was considered that over 15km, these effects would be negligible, including the emissions due to aircraft moving to or from the airport.

3.3.2.7 Ten European protected sites are located within the initial search radius of 15km (see **Figure 5.1** within this report), the details of which (including their qualifying interest features) are presented in **Table B.1** in **Appendix B** (in order of their distance from the Order Limits). The sites are as follows:

- Thanet Coast and Sandwich Bay SPA;
- Thanet Coast and Sandwich Bay Ramsar;
- Thanet Coast SAC;
- Sandwich Bay SAC;
- Outer Thames Estuary ~~Marine~~ SPA;
- Margate ~~&~~ and Long Sands ~~SCI (Inshore Marine)~~SAC;

- Stodmarsh SPA;
- Stodmarsh SAC;
- Stodmarsh Ramsar; and
- Blean Complex SAC.

3.3.2.8 As recommended by PINS Advice Note 10 (PINS, 2017), a full summary of the HRA screening process upon all the European sites potentially affected by the Proposed Development is provided in **Appendix A**: Screening Matrices.

3.3.3 Identification of Potential Impacts

3.3.3.1 To determine which of the qualifying features of the ten European sites require consideration within the HRA, it is necessary to understand:

- What types of activities may be associated with the Proposed Development;
- The receptor groups[8] that may be affected by the potential adverse effects identified (based on Annex I habitats and Annex II species[9] listed on the *Habitats Directive* and Annex I birds listed in the *Birds Directive*[10]); and
- The geographic extent over which the potential effects could manifest themselves.

3.3.3.2 A number of habitats and species' receptor groups are likely to be sensitive to activities undertaken during the construction and operational phases of the Proposed Development; the potential for adverse effects to arise on individual species will depend on that species' use of the area potentially impacted. It is necessary to consider the effects on both the qualifying species and the habitats they depend upon, both within the boundaries of European sites, but also on adjacent habitats, which qualifying bird species (such as golden plover) might use for foraging and resting. This habitat would then be considered functionally linked to the SPA, and could be located several kilometres from the SPA.

3.3.3.3 In view of this, a number of potential impacts have been identified which may arise as a result of each phase of the Proposed Development (it should be noted, that there is an overlap in the timing of parts of the construction and operational phases of the development), and which have the capacity to adversely affect habitats and species that are the qualifying interest of European sites, as described below.

Construction phase

- Removal of habitats (such as grassland) within the Proposed Development area to facilitate construction works. These habitats might be used for foraging/ nesting by qualifying species of birds (e.g. golden plover), and thus be considered 'functionally linked' to the SPA;
- Effects of aural and visual disturbance on qualifying species due to noise and vibration and movement of construction vehicles and site operatives;
- Loss of pollutants or fine material from the construction site due to surface water flows during rainfall events. This pollution may then find its way into European sites via watercourses or the outfall which discharges into Pegwell Bay;

[8] Note that all Annex II species that could be affected if they were present are included. At this stage, no determination of likelihood of presence based on distribution, habitat type etc. is made to avoid bias in the definition of geographic extent used to identify which European sites could potentially be adversely affected by the Proposed Development;
[9] Annex II species features of SACs in the UK are described at http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_species.asp. Annex I habitat features of SACs in the UK are described at http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_habitats.asp
[10] Annex I bird features of SPAs in the UK are described at http://jncc.defra.gov.uk/page-1418

- Deposition of oxides of nitrogen (NOx) from engine exhausts from construction vehicles and generators (on-Site) on habitats within European sites, or functionally linked habitats;
- Deposition of NOx and NOx concentrations in air from engine exhausts from construction vehicles travelling to and from the Order Limits (off-Site) on habitats within European sites, or habitats functionally linked to the European site; and
- Deposition of dust from the construction site onto functionally linked habitats and habitats within European sites.

Operational phase

- Disturbance to qualifying species (e.g. golden plover foraging on farmland adjacent to the Order Limits) due to noise and vibration and movement during ground activities, such as cargo loading, plane maintenance and airfield management;
- Disturbance to qualifying species due to the activities associated with bird-strike hazard management through use of bird scaring devices (e.g. pyrotechnics, distress call broadcast etc.);
- Disturbance to qualifying species (including the airport forming a barrier to the movement of birds between their foraging and roost sites) during aircraft take-off and landing, caused by noise and the visual presence of aircraft;
- Deposition of NOx from aircraft engines on habitats within European sites, or functionally linked habitats. Results from air quality modelling conclude that the effects of particulates and sulphur on vulnerable habitats are predicted to be negligible and have therefore not been considered further within this assessment (see **Chapter 6: Air Quality** of the ES);
- Deposition of NOx and NOx concentrations in air from engine exhausts from vehicles travelling to and from the Order Limits (off-Site) on qualifying habitats within European sites, or habitats functionally linked to the European site;
- Disturbance to qualifying species by ground vehicle usage outside the Order Limits (e.g. along roads used by vehicles accessing and leaving the Order Limits); and
- Effects on qualifying habitats due to pollutants held within surface water runoff from the Order Limits, entering European sites via the outfall or natural watercourses.

Decommissioning phase

- The potential effects during the decommissioning phase are considered to be similar to those identified during the construction of the Proposed Development.

3.3.4 Screening Opinion and Consultation

3.3.4.1 Since 2015 and throughout the undertaking of the survey and assessment work, RiverOak has engaged with consultees with an interest in the potential effects of the Proposed Development on biodiversity. An EIA scoping report (see **Appendix 1.1, ES Chapter 1: Introduction**), including a chapter covering biodiversity, was produced and submitted to PINS who provided a Scoping Opinion (see **Appendix 1.2, Chapter 1: Introduction**).

3.3.4.2 Organisations that were consulted include:

- PINS;
- NE;
- Environment Agency (EA);
- KCC;
- Thanet District Council (TDC);

- The Royal Society for the Protection of Birds (RSPB); and
- The Kent Wildlife Trust (KWT).

3.3.4.3 Meetings have been held with NE and KWT[11]. RSPB confirmed (by email[12]) that they did not wish to meet or participate in the HRA screening process for this project other than responding (or not) to the public consultation materials and/or application documents as these are released. KWT indicated that, although they would still like to be consulted, they would not participate in meetings due to resource constraints. Information and an opportunity to engage in the HRA screening process has been provided to KCC and TDC. Consultation was also undertaken with the Kent Downs Area of Outstanding Natural Beauty Unit[13].

3.3.4.4 A summary of the consultee comments and responses received on the Scoping Report and the 2017 Preliminary Environmental Information Report (PEIR), with regard to the HRA is provided in **Table C.1** in **Appendix C**, and for the 2018 PEIR provided in **Table C.2** in **Appendix C.**

3.3.5 Evidence Base

Desk study and literature review

3.3.5.1 A Desk Study was carried out in order to obtain contextual data and to gain further information on European sites within 15km of the Order Limits and their qualifying interests that are likely to be affected by the Proposed Development, the results of which are provided in the **Appendix 7.2 of ES Chapter 7: Biodiversity**. Primary sources of contextual data identified included:

- The Government's Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/) and the JNCC website (www.jncc.defra.gov.uk): details of the locations and reasons for designation of European sites;
- The Kent and Medway Biological Records Centre (KMBRC): priority habitats, and records of legally protected and priority species;
- 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 (2003) and Henderson & Sutherland (2017);
- Kent Ornithological Society (KOS): bird records were extracted from their online database, for all species within 5km of the Order Limits (http://birdgroups.co.uk/kos/default.asp, accessed in August 2016);
- Kent Bird Reports 2013 and 2014: annual reports published by KOS, containing notable bird records in Kent (Privett [ed.] 2015, 2016);
- Kent Breeding Bird Atlas 2008-13 (Clements *et al*., 2015): results from a county-wide survey, mapping the distribution of all breeding bird species at a tetrad (2x2km National Grid Reference square) resolution;
- 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) were 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);
- Civil Aviation Authority (CAA) bird strike data for Kent International Airport (the previously operational airport at Manston) and CAA documents and guidance (e.g. CAP 772); and

[11] The contact at KWT was Vanessa Evans.
[12] Dated 09/11/2016, from Dora Querido, Conservation Officer, South-east Regional Office.
[13] The Kent Downs AONB Unit is based in Ashford, Kent. http://www.kentdowns.org.uk/

- Data derived from ESs for other proposed and consented developments for which information is publicly available, including:
  - Stone Hill Park (OL/TH/0550), a proposed residential development that shares a common boundary with the Order Limits over much of its area;
  - Land East of Haine Road (OL/TH/14/0050), adjacent to the east of the Order Limits;
  - Land south of Great West Autos (F/TH/12/0722), a now built solar farm, adjacent to the north of the Order Limits;
  - Land east of Worlds Wonder (F/TH/14/0645), a proposed solar farm adjacent to the north of the Order Limits; and
  - Land North of Thorne Farm (F/TH/13/0596): a now built solar farm adjacent to the south of the Order Limits.

3.3.5.2 A literature review was undertaken into studies related to the reaction of birds to visual and aural disturbance caused by aircraft, the results of which are provided in **Appendix 7.4, Chapter 7: Biodiversity** of the ES. This information was used to identify the lateral distance at ground level and the altitude beyond which birds are unlikely to be disturbed by over-flying aircraft. This review focussed on the qualifying species (or closely related species / species-groups) potentially affected by the Proposed Development.

Field surveys

3.3.5.3 Wintering bird surveys were undertaken due to the proximity of the Thanet Coast and Sandwich Bay SPA and Ramsar site, and the Sandwich Bay to Hacklinge Marshes SSSI, all of which are important or designated for their wader and waterfowl interest. Two stand-alone survey methodologies were employed, the results of which are provided in **Appendix 7.5 in Chapter 7: Biodiversity** of the ES as follows:

- Functional habitat surveys, involving the survey of farmland up to 2km from the boundary of the Order Limits (at the time of survey commencement in September 2016). The functional habitat surveys targeted golden plover (as well as other farmland/ notable bird species) and were carried out once per month from September 2016 to March 2017; and
- Pegwell Bay distribution bird surveys were undertaken one day per month, from October 2016 to March 2017, over a six-hour diurnal period capturing a partial tidal cycle within each visit. When possible, survey dates coincided with daytime high tides.

3.3.6 Identification of Geographical Parameters to Screen European Sites

3.3.6.1 A set of geographic distance criteria and rules (geographic parameters) have been used to define the ZoI within which to identify those European sites within 15km of the Order Limits that might be adversely affected by the Proposed Development. The parameters provide a filter for the identification of European sites using the JNCC website (www.jncc.gov.uk) and the Defra GIS mapping tool MAGIC (http://magic.defra.gov.uk/)[14]. These geographic parameters have been derived from guidance, best practice, modelling and studies for that particular effect and activity (i.e. air quality from road traffic, noise from aircraft etc). The activities, changes, receptors and potential adverse effects that have been identified are outlined in **Table 3.1**, alongside the geographic parameters. It should be noted that from Year 2 of the Proposed Development, the construction and operational phases are planned to occur coincidentally.

3.3.6.2 In-combination effects for the activities identified in **Table 3.1** will include developments and plans (listed in **Table 18.2, Chapter 18: Cumulative Effects** of the ES) that, if the same search area was

[14] The geographic extent of the parameters described in **Table 3.1** excludes the potential for transboundary effects (i.e. effects that might impact European sites located outside of the UK).

imposed upon their site boundaries, would overlap with any European Site(s) that could be affected by the Proposed Development alone.

Table 3.1 Identification of Geographic Parameters for HRA Screening of the Proposed Development

Activity	Potential Change	Potential Effect	Geographic Extent
CONSTRUCTION PHASE			
Construction activity including use of plant and presence of workforce	Production of aural and visual stimuli due to noise and vibration and movement of construction vehicles and engineers	Disturbance / displacement of birds (designated features of SPA) resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	European sites (designated for ornithological features) and functionally linked habitats (for European sites supporting designated features such as golden plover that may rely on the functionally linked habitats) within **750m** of the construction site. This is a precautionary distance based on information reported on disturbance in the literature (e.g. Cutts, Phelps & Burdon 2009, Ruddock & Whitfield 2007).
Use of chemicals (e.g. fuels, solvents etc.) and the liberation of fine material (e.g. through excavation).	Loss of pollutants or fine material from the construction site due to surface water flows during rainfall events.	The introduction of toxic pollutants or sediments resulting in loss of, or damage to terrestrial or freshwater environments leading to effects on habitats, flora, invertebrates, amphibians, bats, otters (as designated features of SACs) and birds (as designated features of SPAs).	European sites supporting terrestrial habitats or species within **100m** of the construction site, including the outfall. This geographic parameter is based on professional judgement following a review of the Environment Agency Pollution Prevention Guidance 5 (which suggests control of impacts can be managed within a distance of 50 m), alongside experience of the extent of sediment deposition and pollutant escapes from construction projects. European sites supporting aquatic habitats or species downstream (and within the catchment area) of any watercourse or drainage channel within 100m of the construction site or at any greater distance where a direct drainage outfall is located. This geographic parameter, for pollutants entering watercourses / drainage systems is based on the justification outlined immediately above and the potential for mobile pollutants to then disperse downstream.
Use of construction vehicles and generator sets.	Deposition of oxides of nitrogen and NOx in air from engine exhausts.	Deposition of oxides of nitrogen and concentrations of NOx in air from vehicle emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in effects on habitats, flora, invertebrates, amphibians, bats, otters (as designated features of	European sites within **200m** of the construction site and/ or wider road network. This geographic parameter is based on Department for Transport (2005) Interim Advice Note 61/04: Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs.

Activity	Potential Change	Potential Effect	Geographic Extent
		SACs) and birds (as designated features of SPAs)	
Dust creation during construction activity	Deposition of dust in areas neighbouring the construction site.	Deposition of dust resulting in loss of or damage to terrestrial or freshwater environments from smothering or enrichment resulting in effects on flora vegetation, invertebrates, amphibians, bats, otters (as designated features of SACs) and birds (as designated features of SPAs)	European sites within **200m** of the construction area, and **500**m of the Order Limits entrance. IAQM guidance (http://iaqm.co.uk/guidance) is to assess ecological receptors which are within 50m of the construction site and within 500m of the Order Limits entrance. Natural England have requested that the 50m parameter be increased to 200m for designated sites.
OPERATION PHASE			
Operation (ground based activities including presence of workforce)	Production of aural and visual stimuli due to noise and vibration and movement during ground activities such as cargo loading, plane maintenance, airfield management (not including bird scaring devices).	Disturbance / displacement of birds (designated features of SPA) resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	European sites (designated for ornithological features) and functionally linked habitats (for European sites supporting designated features such as golden plover that may rely on the functionally linked habitats) within **750m** of the construction site. This is a precautionary distance based on information reported on disturbance in the literature (e.g. Cutts, Phelps & Burdon 2009, Ruddock & Whitfield 2007).
Operation (aircraft take-off and landing)	Production of aural and visual stimuli due to noise, aircraft presence and shadow cast.	Disturbance / displacement of birds (designated features of SPA), including the barrier effects (the airport may form a barrier to the movement of birds between foraging and roost sites), resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	Results from the literature review (**Appendix 7.4 in Chapter 7**) indicate a precautionary Lateral Disturbance Distance of **1km** from flight paths at altitudes up to **500m**. This review also indicates that above altitude of **500m**, there would be negligible levels of visual disturbance to birds on the ground due to the visual presence and shadow cast from the overflying aircraft. The review also indicates that at ground level, noise levels below 70 dB LAmax (see **Table 12.1 in Chapter 12**) are unlikely to result in disturbance to birds (see **Figures 4.1a and 4.1b**).

Activity	Potential Change	Potential Effect	Geographic Extent
Operation (aircraft take-off and landing, and ground-based activities)	Deposition of oxides of nitrogen and NOx in air from aircraft engines; road traffic within the Order Limits, and along roads used by vehicles entering and leaving the Order Limits.	Deposition of oxides of nitrogen and concentrations of NOx in air from vehicle emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in effects on habitats, flora, and invertebrates (as designated features of SACs) and birds (designated feature of SPAs).	The EA guidance note "*Air emissions risk assessment for your environmental permit*" (EA, 2016)[15] indicates that the impact of the installation should be evaluated at protected conservation areas that meet the following criteria: SPAs, SACs or Ramsar sites within **10km** of the installation (or within 15km of coal or oil-fired power stations). The geographic extent for the potential effects of nitrogen deposition from aircraft and ground-based traffic has been determined from the results of air quality modelling, the details of which are provided in **Chapter 6**. European sites within **200m** of the construction site and/ or wider road network should also be included for consideration for ground-based activities. This geographic parameter is based on Department for Transport (2005) Interim Advice Note 61/04: Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs.
Management of bird strike risk	Use of bird scaring devices (e.g. pyrotechnics, distress call broadcast etc.).	Disturbance / displacement of birds (designated features of SPA) resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	A precautionary distance of **1km** from the runway area has been used, beyond which the effects of disturbance to birds is considered negligible. This distance has been based on trials undertaken at London Ashford Airport at Lydd in Kent[16] and reference to CAA (2014)[17].
Management of surface water run-off and mobile pollutants (e.g. fuels and lubricants)	Loss of pollutants from road surface due to surface water flows during rainfall events.	The introduction of toxic pollutants (and the effects of scouring by fluid emitted from the outfall) resulting in loss of or damage to terrestrial or freshwater environments leading to effects on habitats, flora, invertebrates, amphibians, bats, otters (as designated features of SACs) and birds (designated feature of SPAs).	European sites supporting terrestrial habitats or species within **100m** of the operational site, including the outfall. This geographic parameter is based on professional judgement following a review of the Environment Agency Pollution Prevention Guidance 5* (which suggests control of impacts can be managed within a distance of 50 m), alongside experience of the extent of sediment deposition and pollutant escapes from construction projects. European sites supporting aquatic habitats or species downstream (and within the catchment area) of any watercourse or drainage channel within **100m** of the construction site or at any greater distance where a direct drainage outfall is located. This geographic parameter, for pollutants entering watercourses / drainage systems is based on the justification outlined immediately above and the potential for mobile pollutants to then disperse downstream.

[15] EA (2016) 'Air emissions risk assessment for your environmental permit'. https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit, dated 2 August 2016.
[16] www.39essex.com/docs/cases/lydd_final_judgment_15_may_14.pdf.
[17] Provides details of a range of portable systems developed specifically for bird control extending beyond 1.5 km from the airport runway. The measures to be employed at the Proposed Development are unlikely to disturb golden plover foraging in fields beyond 1km.

Activity	Potential Change	Potential Effect	Geographic Extent
Ground vehicle usage (including on major routes accessing the airport)	Deposition of oxides of nitrogen from engine exhausts.	Deposition of oxides of nitrogen from vehicle emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in effects on habitats, flora, invertebrates, amphibians, bats, otters (as designated features of SACs) and birds (designated feature of SPAs)	European sites within **200m** of the airport boundary and/or major road links with Manston Airport (the wider road network). This geographic parameter is based on Department for Transport (2005) Interim Advice Note 61/04: Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs.

3.3.7 Screening Summary

3.3.7.1 By applying the geographic parameters for the potential effects identified in **Table 3.1** to the initial search list of European sites within 10km of the Order Limits (provided in **Appendix B)**, a total of four European sites have been identified as being potentially affected by the Proposed Development, and other developments and plans for which in-combination effects could occur, as follows (full designation information and their conservation objectives is provided in **Appendix D**):

- Thanet Coast and Sandwich Bay Ramsar Site;
- Thanet Coast and Sandwich Bay SPA;
- Thanet Coast SAC; and
- Sandwich Bay SAC.

3.3.7.2 By applying the geographic parameters identified in **Table 3.1**, together with consideration to the conservation objectives of the site's qualifying features (see **Appendix D**) and the lack of connectivity and the likely impacts pathways resulting from the Proposed Development, none of the qualifying features for the following European sites have been considered for further assessment:

- Stodmarsh SPA;
- Stodmarsh Ramsar Site;
- Stodmarsh SAC;
- Outer Thames Estuary ~~Marine~~ SPA;
- Margate ~~&~~ and Long Sands ~~SCI (Inshore Marine)~~SAC; and
- Blean Complex SAC.

3.4 Step 4: Screening Assessment of Likely Significant Effects

3.4.1.1 The following screening of potential impacts presented in **Table 3.2** identifies each of the (potentially affected/ screened in) qualifying interest features of the four European sites listed previously. Each qualifying feature is listed with the potential adverse effects associated with that feature, together with the relevant conservation objectives. Each qualifying feature is then screened in or out, based on whether it is concluded that they are likely to be significantly affected or not by the Proposed Development (and other developments and plans in combination). The rationale for these conclusions are outlined in the table, based on the geographic parameters provided in **Table 3.1**, and taking into consideration the conservation objectives of the qualifying features and their condition status. Results from the ornithological desk study (**Appendix 7.2, Chapter 7: Biodiversity** of the ES) and field survey (**Appendix 7.5, Chapter 7: Biodiversity** of the ES) also inform the rationale, as well as the assessment of effects included within the separate ES chapters for:

- **Chapter 6: Air Quality;**
- **Chapter 8: Freshwater Environment;**
- **Chapter 12: Noise and Vibration;**
- **Chapter 16: Climate Change; and**
- **Chapter 18: Cumulative Effects.**

3.4.1.2 If no LSE is identified from this screening exercise, the effect is 'screened out' and the conclusion is reached that the proposed re-opening of Manston Airport will have a negligible effect both alone and in-combination with other developments and plans. For those effects that cannot be 'screened out' at this stage, further detailed consideration into LSEs is provided within the information to permit Appropriate Assessment in **Section 4**.

3.4.1.3 As recommended by PINS Advice Note 10 (PINS, 2017), a full summary of the HRA screening process upon all the European sites potentially affected by the Proposed Development is provided in **Appendix A**: Stage 1, Screening Matrices.

Climate change

3.4.1.4 The release of greenhouse gases from vehicles, machinery and aircraft (in particular) has the potential to contribute to climate change which could affect all of the designated features of European sites considered in this report. For example: climate change may lead to crop management changes resulting in the loss of foraging habitat for golden plover. Climate change may also lead to changes in the distribution of wintering golden plover and turnstone due to other areas within the UK and abroad becoming more suitable for the species, leading to decline in the SPA/ Ramsar populations. Climate change has the potential to affect the habitats that red data book invertebrates depend upon (i.e. for the Thanet Coast and Sandwich Bay Ramsar), and to result in changes to the vegetation/ species compositions of the qualifying (sand dune) habitats of the Sandwich Bay SAC.

3.4.1.5 An in-combination climate change impacts assessment is provided in **Chapter 16: Climate Change** of the ES. One of the primary aims of the assessment in terms of potential effects on biodiversity is to determine where climate change increases the exposure of environmental receptors to an extent that a new significant effect is found. The assessment of likely significant effects associated with the Proposed Development considers the construction and operational phases of the Proposed Development. The significance level attributed to each effect will be assessed based on the magnitude of the climate change impact and the sensitivity of the affected receptor to resulting changes.

3.4.1.6 Results from the climate change assessment (provided in **Chapter 16: Climate Change** of the ES) concludes that the Proposed Development is likely to provide a very small input/ contribution to overall global climate change. In view of this, the effects of climate change on the qualifying features listed in **Table 3.1** can effectively be scope out for further, more detailed assessment**.**

Table 3.2 Screening Assessment

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
Thanet Coast and Sandwich Bay Ramsar site[19] (0m)	Turnstone (non-breeding) (Criterion 6)	Maintain and restore the extent, distribution, structure and function of habitats turnstone reply upon, and their supporting processes. Maintain and restore the population and distribution of turnstone[20]	**Construction phase (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the Ramsar site from the currently operational outfall.	Results from the desk study and field survey indicate that turnstone regularly use the northern shores of Pegwell Bay (within the Ramsar/SPA) for roosting and foraging.	There is the potential for adverse effects to the habitat utilised by foraging and roosting turnstone (mudflats and rocky shoreline) from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during construction of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the Ramsar site.	**Screened in**
			Construction phase (noise): Noise, vibration and physical activity within the Order Limits from earthworks, fixed and mobile plant during the construction phase provides potential for foraging/ resting turnstone to be displaced from any suitable habitat close to the Order Limits. Increased noise and vibration may also occur due to an increase in construction road traffic.	Evidence from the desk study and survey indicate that turnstone do not utilise any habitats within the 750m of the Order Limits. This is a precautionary disturbance distance is based on information reported on disturbance in the literature (e.g. Cutts, Phelps & Burdon 2009, Ruddock & Whitfield 2007).	In view of the lack of presence of turnstone within 750m of the Order Limits: no adverse effects are predicted on the extent and structure of the habitats turnstone rely upon, or the numbers and distribution of this species due to the construction works. No LSE is predicted.	Screened out

[18] Full designation information is provided in **Appendix B.**
[19] Conservation objectives for all sites are listed in **Appendix D.**
[20] The conservation objectives for turnstone for the Ramsar site have been taken as being the same as for the SPA of the same name, with which it shares a common boundary over much of its area.

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			Operation Phase (noise/visual presence from aircraft): Disturbance / displacement of turnstone resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.	Results from the desk study and field survey indicate that turnstone regularly use the northern shores of Pegwell Bay (within the Ramsar/SPA) for roosting and foraging.	Turnstone are known to utilise intertidal habitats close to the inward and outward flight paths of planes to the east of the Order Limits. Therefore, noise and visual presence of aircraft has the potential to adversely affect the population and distribution of turnstone. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the Ramsar site.	**Screened in**
			Operation Phase (air quality): Deposition of oxides of nitrogen from aircraft and vehicle emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community and the invertebrates that turnstone forage upon.	Results from the desk study and field survey indicate that turnstone regularly forage on rocky shores and mudflats within the Ramsar/SPA in Pegwell Bay.	Turnstone primarily forage along shorelines and on rocky beaches, neither of which are identified as habitats vulnerable to nitrogen deposition (www.apis.ac.uk/indicative-critical-load-values). APIS have not assigned a critical load value for NOx deposition to these habitat types (see www.apis.ac.uk/indicative-critical-load-values, and **Chapter 6**). In addition, a critical load value >34 kg N ha^{-1} y^{-1} has been assigned to 'mudflats and sandbanks not covered by seawater at low tide' in an analysis of sensitive Natura 2000 habitats in the Netherland (van Dobben *et al*., 2012). This habitat was one of the least sensitive to nitrogen deposition in the analysis of 75 different habitat types. In view of this, no adverse effects on the habitats turnstone reply upon are predicted. No LSE is predicted.	Screened out
			Operation phase (bird scaring): Disturbance / displacement of turnstone resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise	No suitable habitat for foraging/roosting turnstone exists within the ZOI (within 1km of the Order Limits). The desk study and field survey also provided no evidence to indicate that turnstone utilise habitats within the ZOI (1km of the Order Limits).	The nearest point within the Ramsar site which provides suitable foraging/ resting habitat (rocky beaches/ intertidal sand and mud) for turnstone is approximately 1.4km south-east of the fringes of the airfield where bird scaring methods would be deployed. In view of this, no adverse effects on the population and distribution of turnstone are predicted. No LSE is predicted.	Screened out

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			created by bird scaring activity.			
			Operation phase (barrier effect): Disturbance / displacement of turnstone due to the Proposed Development forming a barrier to the movement of birds between foraging and roosting sites, resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	Studies undertaken by Hodgson (Hodgson, 2016) conclude that turnstone flight paths are likely to closely follow the coastline, and are therefore unlikely to be cross the Order Limits.	There is no evidence to indicate that the flight paths of turnstone cross or will cross the Order Limits. In view of this, no adverse effects on the population and distribution of turnstone are predicted. No LSE is predicted.	Screened out
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the Ramsar site from the currently operational outfall	Results from the desk study and field survey indicate that turnstone regularly forage and roost on rocky shoreline and mudflats within close vicinity of the outfall in Pegwell Bay.	There is the potential for adverse effects to the habitat utilised by foraging and roosting turnstone (mudflats and rocky shoreline) from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during operation of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the Ramsar site.	**Screened in**
	15 British Red Data Book invertebrate species (Criterion 2)	Maintain and restore the extent, distribution, structure and function of habitats the qualifying feature invertebrate species reply upon, and their supporting processes. Maintain and restore the populations and distributions of the	**Operation Phase (air quality):** Deposition of oxides of nitrogen from aircraft emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in direct or indirect effects on listed invertebrates.	The wetland habitats support 15 British Red Data Book invertebrates.	Air quality modelling indicates that habitats upon which the invertebrate species are likely to depend are located within the ZOI in which adverse effects could occur due to NOx, and that these habitat types (including freshwater marshes and sand dunes) are sensitive to nitrogen deposition (see **Chapter 6**). In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the Ramsar site.	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
		qualifying feature invertebrate species.				
			Construction phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage (including scouring) to habitats that the invertebrates depend upon, due to run-off entering the Ramsar from the outfall.	The wetland habitats support 15 British Red Data Book invertebrate species.	None of the 15 British Red Data Book invertebrate species are known to be associated with the mudflat habitats that could be potentially adversely affected by discharge from the outfall (due to scour). All the habitats likely to support the invertebrate species (sand dunes, grassland and other freshwater wetland habitats) are located well beyond 100m of the outfall, beyond which, no LSE is predicted (see **Table 3.1**). In view of this, no adverse impacts on the invertebrate species are predicted.	Screened out
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage (including scouring) to habitats that the invertebrates depend upon, due to run-off entering the Ramsar from the outfall.	The wetland habitats support 15 British Red Data Book invertebrates.	None of the 15 British Red Data Book invertebrate species are known to be associated with the mudflat habitats that could be potentially adversely affected by discharge from the outfall (due to scour). All the habitats likely to support the invertebrate species (sand dunes, grassland and other freshwater wetland habitats) are located well beyond 100m of the outfall, beyond which, no LSE is predicted (see **Table 3.1**). In view of this, no adverse impacts on the invertebrate species are predicted.	Screened out
Thanet Coast and Sandwich Bay SPA (0m)	Golden plover (non-breeding)	Maintain and restore the extent, distribution, structure and function of habitats golden plover reply upon. Maintain and restore the population and distribution of golden plover	**Construction phase (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage (including scouring) to intertidal habitats that golden plover depend upon, due to run-off entering the SPA from the currently operational outfall.	Evidence from the desk study and survey indicate that golden plover utilise the mudflats and adjacent saltmarsh within close proximity to the outfall for roosting.	There is the potential for adverse effects to the habitat utilised as a roosting site by golden plover from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during construction of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**
			Construction phase (noise): Noise, vibration and physical activity within the Order Limits	Evidence from the desk study and survey indicate that golden plover utilise the arable farmland within	Due to the presence of golden plover within 750m of the Order Limits, there is the potential for construction noise to adversely impact on the population and distribution of golden plover. In view	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			from earthworks, fixed and mobile plant during the construction phase provides potential for foraging/ resting golden plover to be displaced from any suitable farmland adjacent to the Order Limits. Increased noise and vibration may also occur due to an increase in construction road traffic.	750m of the Order Limits albeit in low numbers. 750m is a precautionary disturbance distance is based on information reported on disturbance in the literature (e.g. Cutts, Phelps & Burdon 2009, Ruddock & Whitfield 2007).	of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	
			Operation Phase (air quality): Deposition of oxides of nitrogen from aircraft emissions resulting in enrichment and/or acidification of habitat and a reduction in the invertebrate prey that golden plover depend upon.	Evidence from the desk study and survey indicate that golden plover utilise the arable farmland adjacent to the Order Limits in low numbers. The intertidal habitat (saltmarsh and mudflats) in Pegwell Bay are used as a roost site by important numbers of golden plover.	The intensively managed, arable farmland utilised by golden plover for foraging, which would receive a high level of input from herbicides and pesticides, is unlikely to be vulnerable to the effects of acidification and/or enrichment due to nitrogen deposition. The saltmarsh and mudflats used by roosting birds in Pegwell Bay are washed by tidal seawater on a regular basis and therefore the structure of the vegetation and suitability as a roost site is unlikely to be changed to such a degree as to be rendered unsuitable, as a result of nitrogen deposition. These habitats have low levels of sensitivity to nitrogen deposition, with values of 21-23 kg N ha^{-1} y^{-1} for *Salicornia/ Spartina* covered saltmarsh and >34 kg N ha^{-1} y^{-1} for mudflats/ sandflats (van Dobben *et al*., 2012). In view of this, no adverse impacts to habitats golden plover rely upon are predicted, due to air quality during operation. No LSE is predicted.	Screened out
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage (including scouring) to intertidal habitats that golden plover depend upon, due to run-off entering the SPA from	Evidence from the desk study and survey indicate that golden plover utilise the mudflats and adjacent saltmarsh within close vicinity to the outfall for roosting.	There is the potential for adverse effects to the habitat utilised as a roosting site by golden plover from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during operation of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			the currently operational outfall.			
			Operation Phase (noise/visual presence from aircraft): Disturbance / displacement of golden plover resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.	Results from the desk study and field survey indicate that golden plover regularly use areas of saltmarsh and mudflats in Pegwell Bay (within the SPA) for roosting. Low numbers of golden plover also forage in farmland surrounding the Order Limits.	Golden plover are known to utilise intertidal and farmland habitats close to the inward and outward flight paths of planes. Therefore, noise and visual presence of aircraft have the potential to adversely affect the population and distribution of golden plover. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**
			Operation phase (bird scaring): Disturbance / displacement of birds resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise created by bird scaring activity.	The desk study and surveys indicate very low levels of use by golden plover in farmland within the ZOI (within 1km of the Order Limits).	Potentially suitable habitat for golden plover is located within the ZIO. Therefore, the bird scaring activities have the potential to adversely affect the population and distribution of golden plover. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**
			Operation phase (barrier effect): Disturbance / displacement of golden plover due to the Proposed Development forming a barrier to the movement of birds between foraging and roosting sites, resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	Desk study and survey data indicate that golden plover roost primarily on Pegwell Bay and forage in the wider areas of farmland to the south-west.	Desk study and surveys indicate low level of use of farmland around the Order Limits, though it is not known what levels of flight activity by golden plover occur over the now disused airfield at Manston. Therefore, barrier effect has the potential to adversely affect the population and distribution of golden plover. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
	Little tern (breeding)	Maintain and restore the extent, distribution, structure and function of habitats little tern reply upon. Maintain and restore the population and distribution of little tern.	**Operation Phase (noise from planes):** Little tern may be prevented from recolonising the SPA due to disturbance/ displacement due to noise and shadow created by planes on take-off and landing.	Little tern no longer breed within the Thanet Coast and Sandwich Bay SPA (Clements *et al*., 2015). Little terns previously bred in summer at Shell Ness (north of Sandwich Bay) and near Plumpudding on the North Thanet coast. When the tide is in the little tern colony at Shell Ness would feed in the shallow coastal waters of Pegwell/Sandwich Bay and in the lower part of the Stour River.	Given the absence of this qualifying interest species from the SPA, no LSEs are considered during either construction or operation of the Proposed Development. However, consideration is given to adverse effects on the SPA due to the potential of the Proposed Development preventing re-colonisation of the SPA by little tern.	**Screened in**
	Turnstone (non-breeding)	Maintain and restore the extent, distribution, structure and function of habitats turnstone reply upon and their supporting processes. Maintain and restore the population and distribution of turnstone.	**Construction phase (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the SPA site from the currently operational outfall.	Results from the desk study and field survey indicate that turnstone regularly use the northern shores of Pegwell Bay (within the Ramsar/SPA) for roosting and foraging.	There is the potential for adverse effects to the habitat utilised by foraging and roosting turnstone (mudflats and rocky shoreline) from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during construction of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the SPA from the currently operational outfall.	Results from the desk study and field survey indicate that turnstone regularly forage and roost on rocky shoreline and mudflats within close vicinity of the outfall in Pegwell Bay.	There is the potential for adverse effects to the habitat utilised by foraging and roosting turnstone (mudflats and rocky shoreline) from the discharge of treated water to Pegwell Bay, through scour at the point of discharge during operation of the proposed development. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			Operation Phase (noise/visual presence from aircraft): Disturbance / displacement of turnstone resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.	The SPA and Ramsar site largely share common boundaries.	Noise and the visual presence of aircraft in flight have the potential to adversely affect the population and distribution of turnstone. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SPA.	**Screened in**
					All other effects identified for this SPA feature have been screened out (see rationale as for Ramsar site above).	Screened out
Sandwich Bay SAC (0m)	Annex I habitats	Maintain and restore the extent, distribution, structure and function of the qualifying habitats (and their typical flora), and the supporting processes they rely upon.	**Construction Phase (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the SAC site from the currently operational outfall.	Annex I (sand dune) habitats occur at their closest, 2.5km south of the Order Limits.	All the qualifying habitats (dunes) are located well beyond 100m of the outfall, beyond which, no LSE is predicted (see **Table 3.1**). In view of this, no adverse impacts on the qualifying habitats and their plant species are predicted. No LSE predicted.	Screened out
			Operation Phase (air quality): Deposition of oxides of nitrogen from road vehicles and aircraft emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant communities within the Annex I habitats.	Annex I (sand dune) habitats occur at their closest, 2.5km south of the Order Limits.	Air quality modelling indicates that sensitive (sand dune) habitats are located within the ZOI in which adverse effects could occur due to air-borne and deposition of nitrogen (see **Chapter 6**). There is therefore the potential for air pollution to adversely impact the extent, distribution and structure of these habitats. In view of this, further assessment has been provided in order to determine any adverse effects on the integrity of the SAC.	**Screened in**

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the SAC from the currently operational outfall.	Annex I (sand dune) habitats occur at their closest, 2.5km south of the Order Limits.	All the qualifying habitats (dunes) are located well beyond 100m of the outfall, beyond which, no LSE is predicted (see **Table 3.1**). In view of this, no adverse impacts on the qualifying habitats and their plant species are predicted. No LSE predicted.	Screened out
Thanet Coast SAC (330m SE)	Annex 1 habitats	Maintain and restore the extent, distribution, structure and function of the qualifying habitats (and the typical species they support), and the supporting processed they rely upon.	**Construction Phase (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the SAC site from the currently operational outfall.	The Annex I habitats (reefs and submerged or partially submerged sea caves) are located, at their closest, 330m from the Order Limits.	The qualifying habitats are located well beyond the ZOI (the 100m geographic parameter, see **Table 3.1**). In view of this, no adverse impacts on the qualifying habitats are predicted. No LSE predicted.	Screened out
			Operation Phase (air quality): Deposition of oxides of nitrogen from aircraft emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant and animal communities that form the designated features.	The Annex I habitats (reefs and submerged or partially submerged sea caves) are located at their closest, 330m from the Order Limits.	The Annex I habitat features are submerged by tidal sea water on a daily basis, and therefore unlikely to be adversely affected by pollution derived from aircraft emissions. APIS have not assigned a critical load value for NOx deposition to these habitat types (see www.apis.ac.uk/indicative-critical-load-values, and **Chapter 6**). In addition, a critical load value >34 kg N ha^{-1} y^{-1} has been assigned to 'reefs' in an analysis of sensitive Natura 2000 habitats in the Netherland (Van Dobben *et al*., 2013). This habitat was one of the least sensitive to nitrogen deposition in the analysis of 75 different habitat types. In view of this, no adverse impacts on the qualifying habitats are predicted. No LSE predicted.	Screened out

Site Name (distance from Order Limits)	Designated Features[18]	Conservation objectives of qualifying feature	Potential Effects	Current Baseline	Screening rationale	Conclusion
			Operation phase (outfall): The introduction of toxic pollutants or sediments resulting in loss of or damage to terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the SAC from the currently operational outfall.	The Annex I habitats (reefs and submerged or partially submerged sea caves) are located, at their closest, 330m from the Order Limits.	The qualifying habitats are located well beyond the ZOI (the 100m geographic parameter, see **Table 3.1**) within which there is potential for water emitted from the outfall to damage the habitats due to scour. Therefore, no adverse impacts on the extent, distribution, structure and function of these qualifying habitats is predicted. No LSE predicted.	Screened out

4. Appropriate Assessment (Stage 2)

4.1.1.1 For those effects and qualifying features that cannot be 'screened out' during the Stage 1, screening exercise, further detailed assessment into whether these effects will result in an adverse impact on the integrity of the European sites is provided this section (**Section 4)**. This information will be provided to the Competent Authority to enable them to undertake an Appropriate Assessment. The assessments in **Section 4** will draw upon the information obtained from the desk study (**Appendix 7.2, Chapter 7: Biodiversity** of the ES), literature review (**Appendix 7.4, Chapter 7: Biodiversity** of the ES) and surveys (**Appendix 7.5, Chapter 7: Biodiversity** of the ES), together with guidance and the consultation exercise. The conclusions reached will also take account of the conservation objectives and condition status of the qualifying features concerned.

4.1.1.2 The European sites and features 'screened in' for detailed assessment are provided in **Table 4.1**, together with the effect and its pathway.

4.1.1.3 As recommended by PINS Advice Note 10 (PINS, 2017), a summary of the assessments into the potential adverse effects on integrity, for all the European sites and their features taken through to Stage 2 is provided in **Appendix E**: Stage 2: Matrices.

Table 4.1 European Sites and their Qualifying Features, Taken Forward for Detailed Assessment

Site Name (distance from Order Limits)	Designated Features[21]	Conservation objectives of qualifying feature	Potential effects and pathway
Thanet Coast and Sandwich Bay SPA (0m)	Turnstone (non-breeding)	Maintain and restore the extent, distribution, structure and function of habitats turnstone reply upon. Maintain and restore the population and distribution of turnstone.	**Construction and Operational Phases (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the SPA from the currently operational outfall. **Operation Phase (noise/visual presence from aircraft):** Disturbance / displacement of turnstone resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.
	Golden plover (non-breeding)	Maintain and restore the extent, distribution, structure and function of habitats golden plover reply upon. Maintain and restore the population and distribution of golden plover.	**Construction and Operational Phases (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that golden plover depend upon, due to run-off entering the SPA from the currently operational outfall. **Construction phase (noise):** Noise, vibration and physical activity within the Order Limits from earthworks, fixed and mobile plant during the construction phase provides potential for foraging/ resting golden plover to be displaced from any suitable farmland adjacent to the Order Limits. Increased noise and vibration may also occur due to an increase in construction road traffic.
			Operation Phase (noise/visual presence from aircraft): Disturbance / displacement of golden plover resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.
			Operation phase (bird scaring): Disturbance / displacement of birds resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise created by bird scaring activity.
			Operation phase (barrier effect):

[21] Full designation information is provided in **Appendix B.**

Site Name (distance from Order Limits)	Designated Features[21]	Conservation objectives of qualifying feature	Potential effects and pathway
			Disturbance / displacement of golden plover due to the Proposed Development forming a barrier to the movement of birds between foraging and roosting sites, resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.
	Little tern (breeding)	Maintain and restore the extent, distribution, structure and function of habitats little tern reply upon. Maintain and restore the population and distribution of little tern.	**Operation Phase (noise from planes):** Little tern may be prevented from recolonising the SPA due to disturbance/ displacement due to noise and shadow created by planes on take-off and landing.
Thanet Coast and Sandwich Bay Ramsar (0m)	Turnstone (non-breeding)	Maintain and restore the population and distribution of turnstone. Maintain and restore the extent, distribution, structure and function of habitats turnstone reply upon. Maintain or restore the supporting processes on which the habitats of turnstone rely.	**Construction and Operational Phases (outfall):** The introduction of toxic pollutants or sediments resulting in loss of or damage to (including scouring) intertidal habitats that turnstone depend upon, due to run-off entering the Ramsar site from the currently operational outfall. **Operation Phase (noise/visual presence from aircraft):** Disturbance / displacement of turnstone resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing.
	15 Red Data Book Invertebrate species (Criterion 2)	Maintain and restore the populations and distributions of the qualifying feature invertebrate species. Maintain and restore the extent, distribution, structure and function of habitats the qualifying invertebrate species rely. Maintain or restore the supporting processes on which the habitats rely.	**Operation Phase (air quality):** Deposition of oxides of nitrogen from aircraft emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in direct or indirect effects on listed invertebrates.
Sandwich Bay SAC (0m)	Annex I habitats	Maintain and restore the extent, distribution, structure and function of the qualifying habitats (and their typical flora), the supporting processed they rely upon.	**Operation Phase (air quality):** Deposition of oxides of nitrogen from road vehicles and aircraft emissions resulting in enrichment and/or acidification of the environment leading to alteration of the plant communities within the Annex I habitats.

4.2 Thanet Coast and Sandwich Bay SPA - Golden Plover (non-breeding)

4.2.1.1 The Stage 1 screening exercise identified the potential for the Proposed Development alone and/or in-combination with other developments and plans, to have an adverse effect on the SPA population of golden plover, due to:

- adverse effects on habitats used by foraging and roosting golden plover in Pegwell Bay due to scouring from water emitted from the outfall during construction and operation;
- disturbance from construction;

- visual and auditory disturbance caused by aircraft flights;
- noise from bird-scaring activities; and
- the potential barrier effect of the Proposed Development to the movement of golden plover between roost and foraging areas.

4.2.1.2 A detailed assessment of these effects on the SPA population of golden plover is provided as follows.

4.2.2 Current Baseline

4.2.2.1 Golden plover is listed in Annex 1 of the Birds Directive[22] (see **Appendix B**). The Thanet Coast & Sandwich Bay SPA was originally designated (under Article 4.1 of the Birds Directive) in part, for the internationally important non-breeding population of golden plover that it supported (during the five-year period 1985/86 – 1989/90, an average peak count of 1,980 golden plover was recorded). Nationally important numbers of non-breeding golden plover are also a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI (which forms one of the two constituent SSSIs of the SPA). However, as part of the third JNCC SPA review (Stroud *et al*., 2016), golden plover was removed as a designated species from the SPA (likely due to declining numbers), although this change is to date unratified.

4.2.2.2 The UK wintering population of golden plover was estimated to be 420,000 birds in winter 2006/07 of which 400,000 were in Britain (Musgrove *et al*., 2013). The wintering population of golden plover in Great Britain increased by 263% from 1984/54 to 2009/10, though has undergone a short-term decline of 41% in the last five years of this period (Cook *et al*., 2013). Numbers increased substantially from the 1980s until around 2005, after which there has been a steep decline.

4.2.2.3 Golden Plover is a qualifying feature of the Thanet Coast and Sandwich Bay SPA, as the SPA regularly supported 0.2% of the population of Great Britain over the five-year peak mean 1991/92-1995/96 (Article 4.1 qualification)[23]. For the purposes of understanding European and National context and in order to determine significance, with respect to effects on the SPA population[24], **Table 4.2** presents a breakdown of population sizes and selection/significance thresholds[25].

Table 4.2 Golden plover Populations and Selection Thresholds

Golden Plover	Population sizes (individuals)	1% Selection/ Significance thresholds
International population	930,000	9,300
GB population	400,000	4,000
1985/86-1989/90, an average peak count	1,980	N/A

[22] *Directive 2009/147/EC (known as the Birds Directive) on the conservation of wild birds* (the codified version of Council Directive 79/409/EEC as amended provides for the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species
[23] Natura 2000 Standard Data Form: Thanet Coast and Sandwich Bay SPA. http://jncc.defra.gov.uk/
[24] The international and national thresholds of importance for golden plover have been obtained from https://www.bto.org/volunteer-surveys/webs/data/species-threshold-levels, accessed 4 December 2017
[25] There is no fundamental biological reason to take 1% of a population as the threshold level for establishing the level of importance of a site. Nevertheless, this percentage is widely considered to be of value in developing measures that give an appropriate level of protection to populations, and has gained acceptance on this basis throughout the world. The criterion was, for example, adopted by parties involved in the *Ramsar Convention 1971*. Thereafter, the 1% level of national species totals has been taken as the basis of assessment in various countries, including Britain (Stroud, Mudge & Pienkowski, 1990)

Thanet Coast and Sandwich Bay SPA	1998/99 to 2002/03 five-year mean peak Pegwell Bay 'roost' count	6,332	N/A
	An average of 1.6% of the GB population (5-year mean peak 1998/9-2002/3)	4,190	N/A
	2010/11 to 2014/15 five-year mean peak Pegwell Bay 'roost' count	**3,285**	**33**

4.2.2.4 The five-year mean peak count of golden plover of 3,285 birds for 2010/11-2014/15 (obtained from WeBS core count data for the Pegwell and Sandwich Bays WeBS count sector) has been used as the basis for this assessment. The numbers of golden plover over-wintering in the area has clearly, varied greatly over the period since the SPA was designated, and therefore, this figure represents the most up-to-date value for the likely population size of golden plover for the SPA.

4.2.2.5 The conservation objectives for the SPA golden plover population are provided in **Appendix D**, and are in summary: to maintain and restore the population and distribution of golden plover, and the habitats and supporting processes they depend upon.

4.2.2.6 Golden plover winter on coastal and inland habitats around Sandwich Bay and Pegwell Bay. Their main feeding habitat is on arable fields and grazing marsh located inland of the dunes of Sandwich Bay (to the south of the Order Limits) and roosting on intertidal areas of Pegwell Bay. The birds using the farmland adjacent to the Order Limits are considered part of the SPA population and thus, this habitat is considered to be a functionally linked to the SPA.

4.2.2.7 A peak count of 530 golden plover was recorded during the Functional Habitat Survey in 2016/17 (**Appendix 7.5** in **Chapter 7: Biodiversity** of the ES) in a field adjacent to the southwest of the Order Limits (see **Figure 4.3**). However, this peak count was exceptional during the survey, with the next largest flock being of 33 birds and the remaining records involving just 1-6 individuals.

4.2.2.8 During the Pegwell Bay Distribution Survey (**Appendix 7.5** in **Chapter 7: Biodiversity** of the ES), golden plover were primarily recorded in November and December 2016, and in February 2017, when 500-850 birds were counted. No foraging birds were observed, with all records relating to flocks of golden plover resting (roosting or loafing) on intertidal habitat close to the high-water mark along the northern and western fringes of Pegwell Bay during low, mid and the high tide periods (see **Figure 4.4**).

4.2.2.9 No golden plover were recorded within the Order Limits during bird surveys undertaken for the proposed Stone Hill Park development in winter 2015/16 (WSP PB, 2016), or during the Functional Habitat Surveys in 2016/17.

4.2.2.10 Henderson & Sutherland (2017) and Griffiths (2003) and data provided by the Sandwich Bay Bird Observatory (SBBO) and KOS show that golden plover occur on both intertidal and inland areas around Pegwell Bay in winter. A range of roost sites have been identified, including Pegwell Bay, but also inland on farmland.

4.2.2.11 Henderson & Sutherland (2017) divided their survey area into a number of Recording Areas, with the only records of golden plover within 2km of the Order Limits being those in their Recording Area 15 to the east of the Order Limits (see **Figure 4.5**). In that area (despite parts in the east being unsuitable for foraging due to the presence of tall Brassica[26] crops), fields of ploughed and fallow land close to Pegwell Bay were used for feeding and roosting in the first half of the winter, as follows:

- A flock of 402 birds was roosting and foraging in a field adjacent to the south-east of the Order Limits on 13 November 2016;

[26] A common brassica crop is oil-seed rape.

- This was followed by 53 birds roosting in a different field (1.3km west of the Order Limits) on 27 November 2016;
- An additional 43 birds were roosting in the same field as the early November record on 31 December 2016; and
- No golden plover were recorded in Recording Area 15 in January and February 2017 (a March survey was not undertaken in this Area). These birds also used Pegwell Bay.

4.2.2.12 Henderson & Sutherland (2017) identified a number of other localities frequently used by golden plover. The highest numbers of roosting and foraging golden plover were to the south of the Order Limits, approximately 3.5km from the Order Limits on arable farmland in the Ash Levels Recording Area 7 where a peak count of 1,030 birds was recorded in January 2017.

4.2.2.13 The mudflats at Pegwell Bay formed a roost site, used intermittently at low tide, with a peak count of 1,000 birds noted there in February 2017. Disturbance caused by bait-diggers and other sources was identified as a continued problem in this area and the likely reason for its intermittent use by golden plover.

4.2.2.14 Unit 3 of the Sandwich Bay to Hacklinge Marshes SSSI (the main location for the roosting golden plover) is in an 'Unfavourable – Recovering' condition. The bird disturbance undertaken at Pegwell Bay in winter 2010/11 (Swandale & Waite, 2012) provides strong evidence indicating that recreational and commercial activities (including dog walking, walking without dogs, bait digging and kite surfing) are having a detrimental impact on bird populations in Pegwell Bay. The report states that:

> "*The most disturbing activity, particularly in the north section of the bay, is dog walkers with dogs off leads. This is being addressed through a dog management strategy which aims to provide alternative open space for dogs off leads. The voluntary agreement over kite surfing also needs to be reviewed given disturbance levels associated with this recreational activity. Continued monitoring is required particularly with regard housing development within Dover and Thanet Districts. Mitigation measures are being sought with regard these development plans including monitoring and possible wardening if monitoring indicates increased disturbance activity*."

4.2.2.15 Other areas of farmland used by roosting and/or foraging birds included:

- Sandwich Marshes (Recording Area 4), with up to 610 birds roosting by the flood-relief pools for the River Stour (4-5km south of the Order Limits);
- Goshall Valley (Recording Area 8, 4-7km south, peak 810 birds); and
- Worth Marshes (Recording Area 1, 8-9km south, peak count 242 birds).

4.2.2.16 Results from the surveys in 2002/03 (Griffiths, 2003) and 2016/17 (Henderson & Sutherland, 2017) show similar patterns of golden plover distribution across the Thanet and Sandwich Bay areas, and indicate that numbers have declined 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).

4.2.2.17 BTO Wetland Bird Survey (WeBS) core count data[27] for Pegwell Bay also shows a general decline in the peak counts of golden plover in Pegwell Bay over the period 2000/01 to 2014/15. A summary of the WeBS data is provided in **Table 4.3** (the figures in parenthesis include additional data obtained for Pegwell Bay outside the standardised WeBS core count dates, obtained from https://app.bto.org/webs-reporting/).

[27] There are two types of WeBS count: Core Counts undertaken at high tide, involving a large number of sites (around 2,800), and Low Tide Counts involving a relatively much smaller number of counts of feeding birds at low tide.

Table 4.3 Peak Monthly Counts of Golden Plover in Pegwell Bay, from Winters 2000/01-2014/15

Winter	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Peak count	Month
2000/01	196	414	41	950	3,160	4,000	1070	1,404	4,000	Feb
2001/02	0	840	2,680	6,000	7,000	2,000	3750	3,711	7,000	Jan
2002/03	0	1,350	2,450	190	5,800	4,710	150	2,441	5,800 (7,229)	Jan
2003/04	62	1,410	6,240	5,500	8,000	1,125	14	3,193	8,000	Jan
2004/05	95	0	3,830	5,200	5,330	4,500	920	3,312	5,330	Jan
2005/06	79	2,070	550	7,000	1,900	2,500	595	2,099	7,000	Dec
2006/07	11	663	3,730	945	2,900	4,170	80	1,785	4,170	Feb
2007/08	25	1,500	4,500	5,500	5,000	4,200	0	3,454	5,500	Dec
2008/09	0	0	2,000	3,500	3,230	3,150	5	2,377	3,500	Dec
2009/10	0	700	1,200	60	753	1,100	410	703	1,200 (3,150)	Nov
2010/11	132	160	3,400	51	2,000	0	0	1,148	3,400 (4,000)	Nov
2011/12	1	1100	1,350	3,000	3,500	0	0	2,237	3,500 (3,640)	Jan
2012/13	1	180	2,000	2,820	4,330	2,820	285	2,072	4,330	Jan
2013/14	16	530	820	1,050	1,093	0	0	701	1,093 (2,000)	Jan
2014/15	1	0	1,147	2,456	0	760	0	1,454	2,456	Dec

Current baseline (noise levels)

4.2.2.18 To characterise the baseline noise environment/ levels in the wider area around the Order Limits (which is dominated by noise from road traffic), measurements and observations were undertaken at 14 locations during both daytime and night-time periods as described in Table 12.2 in **Chapter 12: Noise and Vibration** (of the ES) and shown in Figure 12.1 in **Chapter 12: Noise and Vibration** (of the ES). An ambient noise level has also been identified to represent each location observed, based on the following:

- Site observation;
- Short-term measurements; and

- Sound propagation modelling of the major sources of sound, namely road traffic movements for locations where the short-term noise level is uncertain; and *Directive 2002/49/EC*[28] Round 2 noise mapping data where road traffic modelling is not possible or rail is the dominant noise source.

4.2.2.19 The baseline noise levels measured from Observation Point 13 (OBS13) located on the northern fringe of Pegwell Bay (the most relevant measurement point in terms of the SPA), showed daytime noise levels of 40-45 dB $L_{Aeq,5min}$[29] and night time noise levels of 40 dB $L_{Aeq,5min}$, primarily due to road traffic. The ambient day and night noise level for OBS13 is 42 dB $L_{Aeq,\ 16hr}$ (see **Table 12.2 in Appendix 12**).

Current baseline (drainage and discharge into Pegwell Bay)

4.2.2.20 The Proposed Development is on relatively high ground, mainly at an elevation between 45-50 mAOD (metres above ordnance datum). The southern portion is located at an elevation of approximately 50mAOD, along the length of the existing runway, but rises to approximately 55mAOD in the westernmost corner of the site. North of the runway the site level declines to approximately 40mAOD 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 red line boundary (RLB) 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.

4.2.2.21 The average annual rainfall recorded at Manston between 1981 and 2010 was 592.5mm30.

4.2.2.22 There are no river watercourses on or adjacent to the Proposed Development, 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 main 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, 3km south of the Proposed Development, which flows east into Sandwich and Pegwell Bays. Currently, runoff from the Proposed Development infiltrates locally and, due to the highly permeable nature of the underlying geology, is unlikely to reach these surface water systems via overland flow routes.

4.2.3 Future Baseline

4.2.3.1 In the absence of development, it is assumed that the Order Limits will remain principally as grassland and hard standing and its immediate vicinity will remain primarily as arable farmland. As a result, the management of this area would be unlikely to change in the foreseeable future and therefore the baseline with respect to the golden plover population of the Thanet Coast and Sandwich Bay SPA would not be altered significantly.

4.2.4 Predicted Adverse Effects

4.2.4.1 Distribution data from the locality of the Order Limits indicate that golden plover utilising farmland to the south, north and west are likely to be connected with the Pegwell Bay (Thanet Coast and Sandwich Bay SPA) wintering population i.e. they disperse from Pegwell Bay at high tide to forage

[28] *Directive 2002/49/EC* of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise [online] Available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049 [Accessed 14/02/2018]
[29] L_{Aeq} indicates average exposure noise level over a measured period, in this case 5 minutes (BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures' BS7445-1:2003). BS 7445 provides guidance for describing and measuring noise from all sources. The standard recommends equivalent continuous A-weighted sound pressure level (L_{Aeq}) as the most appropriate basic noise indicator.
[30] Meteorological Office (Met. Office): http://www.metoffice.gov.uk/public/weather/climate

on farmland in the wider area. As a result of the likely movements of birds between high-tide foraging areas around the Order Limits and Pegwell Bay at low tide, and their use of the surrounding farmland for foraging and roosting, there is potential for adverse effects on the golden plover population, due to:

- Auditory, visual, and vibration stimuli caused by vehicles, machinery and their operatives during construction and operation of the Proposed Development;
- Auditory disturbance caused by any onsite pyrotechnical bird scaring methods during operation of the Proposed Development;
- Auditory and visual disturbance caused by over-flying aircraft, and aircraft departing from and arriving at the airport;
- The potential barrier effect of the airport to the movements of birds between foraging and roost sites; and
- Damage to habitats (primarily mudflats) used by roosting golden plover in Pegwell Bay due to scouring caused by water emitted from the outfall in Pegwell Bay, during construction and operation.

Construction displacement - habitat loss due to disturbance

4.2.4.2 Noise, vibration and physical activity within the Order Limits from earthworks, fixed and mobile plant, and the visual presence of operatives during the construction phase has the potential for foraging and resting golden plover to be displaced from any suitable farmland within 750m of the Order Limits (see **Table 3.1**). Increased noise and vibration may also occur due to an increase in construction road traffic. As construction noise, vibration and activity within the Order Limits is currently lacking and also likely to be unpredictable, it has a greater potential to cause disturbance than an increase in road traffic noise and vibration. This is because birds in the vicinity of the airport are likely to be habituated to current road traffic noise and vibration and its more predictable pattern.

4.2.4.3 Survey of golden plover in northeast Kent, including the area surrounding the Order Limits in winter 2003/04 (Griffiths, 2004) identified no concentrations of golden plover within 750m of the Order Limits; the data for this work was collected whilst Manston Airport was still operational.

4.2.4.4 Survey of farmland habitat around the Order Limits in 2016/17 has also shown limited use by foraging and roosting golden plover of these areas within 750m of the Order Limits (**Appendix 7.5, Chapter 7: Biodiversity** of the ES, Henderson & Sutherland 2017). Between September 2016 and February 2017 inclusive, few golden plover were recorded, with generally five or less birds noted within 1km of the Order Limits. An exception to this, was during the November survey, when a flock of 530 golden plover was recorded in an arable field immediately to the south of the Order Limits at its eastern end (**Appendix 7.5** in **Chapter 7: Biodiversity** of the ES). Soon after this record, the field was cultivated and no further records were obtained from that location. This flock was also recorded during the surveys reported in Henderson & Sutherland (2017).

4.2.4.5 The desk study and winter bird surveys indicate that golden plover do not make regular use of farmland within 750m of the Order Limits, although birds may use it opportunistically, depending upon suitability of crop type. Golden plover rarely remain faithful to a single site throughout the winter but tend to use a number of sites dependant on food availability and weather conditions (Percival, 2007). The Order Limits is located adjacent to an extensive area of arable farmland (to the west, north and south), and therefore any birds displaced by the Proposed Development are likely to find alternative foraging sites within their usual foraging ranges. This is supported by the desk study and survey results in that birds were generally recorded at any one location during only part of the non-breeding season period, suggesting that they were foraging widely, moving to alternative feeding sites in response to changing crop structure, food availability and weather conditions.

4.2.4.6 Golden plover are very much dependent upon the presence of suitable foraging areas during autumn and winter. Mason & MacDonald (1999), in their study of wintering populations of golden plover in north-east Essex, found that the former species showed a strong association for winter cereals. Much of the foraging activity of golden plover in their study was recorded in fields of cereal less than 100mm in height, with golden plover rarely recorded on other crop or habitat types such as cereal stubble and rape. Kirby (1997) identified many other factors that might influence the changing use of a site by golden plover. One of the main food sources are earthworms, which occur in much higher densities in the early stages of an arable crop rotation, with very few present in fields that have been under continuous arable cultivation for three or more years (Kirby, 1997). Large open fields are most favoured (Kirby 1997, Mason & MacDonald 1999) and during prolonged periods of hard weather, when the ground has been frozen for at least three days, lapwing and golden plover move from arable fields to grassland, where invertebrate prey remains more accessible. Where grassland is not present, the birds often leave the area for warmer climes such as in France and on the Iberian Peninsula (Kirby, 1997).

4.2.4.7 It should also be noted that these studies focus on the use of habitats during the day, and that golden plover are known to use different habitats to forage in during the night (Gillings *et al*., 2005). A study of plovers on Thanet during 2016 (M. Sutherland, unpublished data) involving eight paired visits by day and night, provided little evidence one way or the other as to whether the nocturnal distribution differed substantially from the diurnal. It was thought that, while locally, birds may be more dispersed at night, it is unlikely that the broad distribution patterns across the various survey areas would be substantially different from that recorded by day (Henderson & Sutherland, 2017).

4.2.4.8 To conclude, any presence of golden plover on farmland adjacent to the Order Limits is likely to be strongly influenced by crop management, in particular, the rotation and relative proportions of rape and winter cereal, the latter providing the bare ground habitat favoured for foraging birds in autumn and early winter. Results from the desk study and surveys indicate that the area within 750m of the Order Limits, which is the area identified within which any disturbance and displacement would occur, does not form an important part of the foraging grounds for the SPA population of golden plover.

4.2.4.9 Given that the functional habitat surveys and other desk study data (e.g. Henderson & Sutherland, 2017) indicate that farmland within 750m of the Order Limits is not used on a regular basis by important numbers of golden plover (with a count of 530 birds in a single month) and with the availability of extensive alternative inland feeding habitat within the vicinity, the effects of displacement on the SPA golden plover population during construction are considered negligible. The main roost site for the species (on Pegwell Bay) is located more than 1km from the Order Limits, and thus is predicted not to be adversely affected by construction works for the Proposed Development.

4.2.4.10 To conclude, there would be no adverse effect on the integrity of the SPA due to disturbance effects on the golden plover population during the construction phase of the Proposed Development.

Operational displacement - habitat loss due to bird scaring activities

4.2.4.11 Once the Proposed Development is operational, there is potential for foraging and roosting golden plover to be displaced from arable land, grazing marshes and intertidal habitats (used for roosting) due to disturbance caused by methods employed at the Proposed Development to reduce/ prevent collision risk by deterring hazardous birds from using the aerodrome and adjacent land. These bird scaring activities may deter golden plovers from using otherwise suitable habitat up to a distance of 1km from the Order Limits (see **Table 3.1**).

4.2.4.12 Trials undertaken to inform the now consented London Ashford Airport expansion concluded that bird scaring activities at the airport might have some disturbance effects up to 0.6-1km away, but that there was no indication that there would be any impacts on the populations[31]. The recommended methods for bird scaring at London Ashford Airport included the use of audio and pyrotechnics, together with virtually continuous patrolling of the airport site.

4.2.4.13 Results from the desk study and surveys also indicate that golden plover do not utilise farmland or intertidal habitats within 1km of the Order Limits on a regular basis. In view of this, the effects of displacement to golden plover by bird scaring activities are considered negligible.

4.2.4.14 To conclude, there would be no adverse effect on the integrity of the SPA due to disturbance/ displacement of golden plover, as a result of bird scaring activities.

Operational displacement - habitat loss due to aircraft flights

4.2.4.15 Once the Proposed Development is operational, there is potential for foraging and roosting golden plover to be displaced from arable land, grazing marshes and intertidal habitats (used for roosting) below or near to the flight paths of planes. The altitude, lateral distance and noise of the aircraft are all factors involved in potential disturbance, although separating the effect of aircraft noise from that of visual disturbance is difficult.

4.2.4.16 There is limited documented evidence on the visual and auditory disturbance effects of aircraft on birds and much of this comes from studies that have focussed on geese, ducks, swans and seabirds. Those studies involving waders (such as golden plover) have looked at the effects of microlights and jets. Also, these studies have mainly been based upon effects associated with aircraft altitude rather than lateral distance.

4.2.4.17 A literature review was undertaken by Amec Foster Wheeler on bird disturbance by aircraft (**Appendix 7.4** in **Chapter 7: Biodiversity** of the ES). Results from this literature review and other studies indicate that beyond distances of 500m in altitude and 1km ground-level, lateral distance, golden plover are unlikely to be disturbed by the visual presence of flying aircraft.

4.2.4.18 An indicative figure of locations overflown by aircraft below 500m is shown in **Figure 4.6**. It should be noted that no aircraft (other than helicopters) are currently operating from the Order Limits and therefore the figure is based on indicative vertical climb profiles, operating procedures and flight paths. The actual procedures and flight paths will be consulted on after the DCO through the CAA's Airspace Change Process (ACP) and the ACP will provide opportunities for engagement with local communities and other stakeholders. The ACP will likely follow the process outlined in the draft ACP guidance CAP1520 (CAA, 2017). However, given the relatively close proximity of Pegwell Bay to the dis-used airfield at Manston, the options for the flight routes to the east of the airfield, just north of Pegwell Bay are very limited. In view of this, the proposed routes of the flights are very unlikely to deviate from those shown in **Figure 4.6,** once agreed with the CAA.

4.2.4.19 The roosting areas for golden plover in Pegwell Bay are located outside the area where aircraft are predicted to fly over at altitudes of less than 500m (see **Figures 4.4 and 4.6**) and are at their closest, 1.5km from the proposed routes for aircraft flights to the east of the airfield (beyond the 1km, lateral disturbance distance). Desk study and survey data also indicate that use of the farmland by golden plover in these areas is also low (see **Figure 4.3**).

4.2.4.20 Results from the literature review in **Appendix 7.4 in Chapter 7: Biodiversity** (of the ES) indicates that noise levels in excess of 80 dB[32] L_{Amax}[33] (peak noise levels) have been recorded as causing the more severe disturbance incidents in a number of studies, primarily in duck species. However, golden plover has been identified as a species of moderate sensitivity to noise disturbance, being

[31] London Ashford Airport, Lydd, Kent. File Refs: APP/L2250/V/10/2131934 and 2131936. Report to the Secretary of State for Communities and Local Government and the Secretary of State for Transport by K D Barton BA(Hons) (an Inspector appointed by the Secretary of State for Communities and Local Government and the Secretary of State for Transport). Date: 9 March 2012.
[32] The ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. Due to this wide range, a scale based on logarithms is used in noise level measurement. The scale used is the decibel (dB) scale which extends from 0 to 140 dB corresponding to the intensity of the sound pressure level.
[33] L_{Amax} is maximum recorded noise level during the measurement period.

tolerant of peak noise levels of up to 72 dB L_{Amax} (Cutts *et al*., 2013). Therefore, a more precautionary peak noise level of 70 dB L_{Amax} has been used for the purposes of this assessment, below which, noise from aircraft flights is very unlikely to elicit a more severe disturbance response (such as taking flight), and thus any effects of noise levels below 72 dB L_{Amax} would be negligible.

4.2.4.21 In addition to the relatively high levels of noise generated from nearby road traffic in the area (as indicated by the baseline noise measurements in **Chapter 12: Noise and Vibration** of the ES), golden plover using farmland adjacent to the Order Limits will also experience regular disturbance from agricultural activities including the high noise levels generated from gas guns[34] (used to scare wood pigeons from fields of oilseed rape, which is widely cultivated in the area), and from organised game shoots, and shooting for pest control purposes.

4.2.4.22 During operation of the Proposed Development, the average daytime noise levels across Pegwell Bay (during the period when peak numbers of aircraft flights will occur), are predicted to be between 50-63 dB L_{Aeq16}, (see **Figure 12.6 in Chapter 12: Noise and Vibration** of the ES), and at night, generally less than 40 dB $L_{Aeq, 8hr}$ (see **Figure 12.7 in Chapter 12: Noise and Vibration** of the ES).

4.2.4.23 In terms of disturbance to birds, the peak noise levels are likely to elicit more of a 'measurable' behavioural response by birds rather than the average noise levels over a period of time (e.g. over the course of a day)[35].

4.2.4.24 The area of land (at ground level) where noise levels in excess of 80 dB L_{Amax} are predicted (during peak periods of operation of the Proposed Development) during the day (07:00 to 23:00 hrs) and night (23:00 to 07:00 hrs) are shown in **Figures 4.1a and 4.1b** respectively, and where noise levels are in excess of 70 dB L_{Amax} shown on **Figures 4.2a and 4.2b** respectively. The different coloured shaded areas denote the mean number of events per day (due to aircraft movements), where peak noise levels of 80 and 70 dB L_{Amax} will be exceeded (respectively), taking into account the proposed flight paths, and combination of different aircraft types/ models that are planned to be in operation in Year 20 when the number of flights will have reached their anticipated peak (worst case scenario). For example, in Figure 4.2a, any birds foraging on land within the outermost shaded area (in light pink) are predicted to experience an average of 10-19 single noise events per day (due to aircraft flights) that exceed 70 dB L_{AMAX} during Year 20.

4.2.4.25 Results from the desk study (**Appendix 7.2** in **Chapter 7: Biodiversity** of the ES) and the Functional Habitat and Pegwell Bay Distribution surveys (**Appendix 7.5** in **Chapter 7: Biodiversity** of the ES) indicate infrequent use by golden plover of areas of farmland within the area where 70 dB L_{Amax} is exceeded (see **Figures 4.3 and 4.5**). In addition, the desk study and survey data also indicate that the main area of Pegwell Bay used by roosting golden plover is not located within the area where noise levels in excess of 70 dB L_{Amax} are predicted (see **Figures 4.2a, 4.2b and 4.4)**.

4.2.4.26 As stated previously, there is limited research and studies on the auditory disturbance effects of aircraft on birds in the UK and therefore, it is important that any case studies into effects on birds at currently operation airports in the UK are also considered in this assessment.

4.2.4.27 There are a number of operational airports in the UK that are located adjacent or close to SPAs designated for their congregations of non-breeding waterfowl and waders, including internationally important numbers of waders utilising mudflats for foraging. These include the civil airports at Belfast, Liverpool, Southampton, Bournemouth, Lydd (London Ashford Airport) and Blackpool (amongst others), and military aviation activities/ operations.

4.2.4.28 **Table 1.2** in **Appendix 7.2** of **Chapter 7 Biodiversity** (of this ES) presents a summary of results of a review of case studies related to the effects of aircraft flights from military and civil airports in the

[34] These are portable devices that are located at the edge of fields to disturb birds from feeding and damaging crops, in particular, rape seed oil. They are setup to typically emit, 3-4 short, loud bursts of noise (bangs) at intervals of c.15 seconds.
[35] NE have indicated their preference for the assessment to be determined on the basis of using the LAmax (peak noise level) metric

UK on nearby SPAs. This study was undertaken to inform the now consented expansion of London Ashford Airport, south of Lydd in Kent (Parsons Brinckerhoff, 2007).The case studies highlighted, show that despite the visual and noise disturbance from civil and military aircraft flights over the SPAs, there have been no recorded adverse effects on their qualifying populations of waders and wildfowl, including non-breeding populations of golden plover on the Ribble Estuary, Wash, North Norfolk Coast, Dungeness to Pett Levels and Lough Foyle SPAs.

4.2.4.29 In addition, there is no evidence to indicate that the numbers of golden plover have increased since airport operations ceased at Manston Airport in May 2014 (see **Table 4.3**), and conversely, numbers appear to have declined.

4.2.4.30 To conclude, evidence from the literature review and case studies indicates that golden plover using Pegwell Bay for roosting, and the farmland surrounding the Order Limits for foraging will very likely habituate to the visual presence and noise from regular aircraft flights from the Proposed Development. Existing levels of noise in these areas are relatively high, primarily due to road traffic but also agricultural activities. The predicted peak noise levels (due to aircraft flights) that would be experienced by golden plover using Pegwell Bay and the surrounding farmland are unlikely to result in high levels of disturbance to these birds. Any golden plover displaced from farmland surrounding the Order Limits would be able to locate other more extensive areas of suitable foraging habitat to the south and west. In view of this, the effects of disturbance to the SPA population of golden plover are predicted to be negligible, and there would be no adverse effect on the integrity of the SPA.

Operational - displacement (barrier effects)

4.2.4.31 Unlike turnstone (the other qualifying/notification wader species of the Thanet Coast and Sandwich Bay SPA and Ramsar Site), golden plover frequently move to inland farmland areas to forage. Movements to and from inland areas and the coast result in the Proposed Development forming a barrier to the movement of golden plover between these sites. If the birds have to undertake flights of greater distance due to the presence of the Proposed Development, this could result in increased energy expenditure and lost foraging time, leading to increased mortality. Therefore, it is important to know the distribution of golden plover surrounding the airport and their likely flight paths between roosting and foraging areas.

4.2.4.32 Results from the desk study (in particular, Henderson & Sutherland 2017) and surveys indicate that much of the golden plover population roosts at Pegwell Bay, and forages on farmland to the south and south-west (more than 3km to the south of the Order Limits). The likely flights of golden plover between their main roost site and foraging areas is thus unlikely to take them across the Order Limits, or the vicinity of flight paths of low flying aircraft. In addition, CAA data obtained during part of the previous operational period for Manston Airport (2007-13) revealed only one record of golden plover collision with aircraft, indicating that the airport did not form part of the regular flight paths for this species.

4.2.4.33 In view of the lack of CAA records of golden plover and the likely flight paths of birds, the levels of flight activity by this species over the Order Limits and adjacent areas are predicted to be low, and as a consequence, the impacts of barrier effect are considered negligible.

4.2.4.34 To conclude, there would be no adverse effect on the integrity of the SPA due to barrier effects on golden plover caused by the presence of the Proposed Development.

Construction displacement - habitat loss due to damage to roosting site caused by outfall

4.2.4.35 This assessment of effects takes into account the environmental measures provided in **Table 7.7 in Chapter 7**, and also **Section 8.5 and Table 8.6 in Chapter 8: Freshwater Environment**).

4.2.4.36 The existing drainage arrangements at the Site, divert rainfall to a sea outfall at Pegwell Bay. This outfall is of sufficient size to accept peak flows without surcharging.

4.2.4.37 The Site drainage network will be put in place during Construction Phase 1. During all phases, any discharges not entering the Site drainage network will be contained on-Site and discharged to the

Site sewer network, following treatment by silt-busters or similar, or taken off-Site. Additional measures, which are detailed in the Construction Environmental Management Plan (CEMP) and put in place to protect the groundwater environment during the construction phase, will also ensure that no potential pollutants reach Pegwell Bay (see **Section 8.5 in Chapter 8**).

4.2.4.38 Only when the Site drainage network is put in place, will discharges be allowed into Pegwell Bay via the outfall. All discharges will only take place once silt and any other potential pollutants (e.g. hydrocarbons) have been removed from Site discharge. The discharge is therefore of clean water.

4.2.4.39 Paragraphs 4.2.4.44 to 4.2.4.47 inclusive present the detailed design strategy for the Site drainage network to ensure that measures are put in place to protect the qualification/notification features of Pegwell Bay's designated sites. These measures will be confirmed with the EA and NE prior to the commencement of works.

4.2.4.40 The drainage strategy is based upon a 150l/s pump capacity. The outfall structure, with a series of four incomplete barriers that reduce the flow rate of the discharge to Pegwell Bay, is a robust structure designed with scour protection to prevent scour to intertidal habitat.

4.2.4.41 Following the incorporation of the environmental measures, it is concluded that all effects on Pegwell Bay will be negligible. Therefore, it is concluded that there will be no adverse effects on the habitats utilised by roosting golden plover in Pegwell Bay, and no adverse effect on the integrity of the SPA due to the outfall during construction.

Operational displacement - habitat loss due to damage to roosting site caused by outfall

4.2.4.42 The operational phase has the potential to have a significant effect on water quality at Pegwell Bay through the following mechanisms:

- The generation of sediment laden run-off entering the Site's drainage system in an uncontrolled manner; and
- Pollution from the spillages of concrete, oils, fuels or other chemicals entering the Site's drainage system or reaching Pegwell Bay through groundwater inflows.

4.2.4.43 Environmental measures incorporated into the Proposed Development (see **Table 7.7 and Section 7.5, Chapter 7**) will be included in the CEMP.

4.2.4.44 As described in **Section 3.4, Chapter 3**: Description of the Proposed Development, the Outline Drainage Strategy for the Site (Appendix A in **Appendix 8.2 of Chapter 8**) provides for positive drainage following the Site's natural contours, discharging into two adjacent attenuation ponds, one for 'dirty' water and one for 'clean' water. Prior to discharging into the ponds, the water will flow through interceptors (existing and new). The 'dirty' pond will treat de-icer contaminated runoff through the use of aerators, before discharging into the second pond. Flow into the 'clean' pond will be limited; the spillway will have a storage capacity of greater than a 1 in 30-year flood event. From the second pond, the clean water will be transported through the existing pumping system to be discharged from the Site. Discharge will only take place from the clean water pond once silt and any other potential pollutants (e.g. hydrocarbons, de-icer) have been removed from Site discharge.

4.2.4.45 A maximum discharge rate of 150 l/s has been assumed in designing the on-site attenuation ponds which been sized to attenuate site run off for the 1% Annual Exceedance Probability (AEP) storm plus a 40% climate change allowance. At the detailed design stage, the Site drainage network design will include consideration of the impact of the peak rate of discharge on the qualification/notification features of Pegwell Bay's designated sites in the construction phase. Further consultation on this point with NE and the EA is also expected to occur at the detailed design stage to ensure that appropriate scour protection is in place. The proposed pumping rate represents a maximum worst case scenario and lower rates could be achieved by using a variable rate pump or further attenuating water on-Site. If further attenuation is required this could be achieved by increasing the surface area of the ponds, by providing limited infiltration of clean run off (e.g. roof drainage), by providing addition attenuation tanks elsewhere on-Site, by providing additional storage capacity with the drainage network by oversizing pipes, by utilising any spare capacity in the Southern Water drainage network or by using clean run-off water elsewhere on-Site. The work to refine and improve attenuation and therefore reduce peak discharge rates is expected to be investigated during the detailed design stage of the project which will come after the order is made.

4.2.4.46 The Fuel Farm site will have its own separate drainage system which will connect to the drainage outfall pipe at Pegwell Bay (see Appendix G of Appendix A in **Appendix 8.2 of Chapter 8**). This drainage system will be fitted with an oil separator and an anti-pollution non-return control valve to ensure that no hydrocarbons enter the drainage outfall to Pegwell Bay and any pollution incident does not leave the Fuel Drainage system.

4.2.4.47 The regulation of Site discharges has been discussed with the Environment Agency [EA] (see **Table 8.6 and Table 8.14 of Chapter 8**) and NE. The EA have indicated that they do not normally permit surface water drainage discharges to sea, however, it is acknowledged that the sensitivity of the features at Pegwell Bay does require appropriate mitigation. It is possible that a permitting approach could be used which combined the use of a Water Discharge Activity Permit to regulate discharges from the 'dirty' to 'clean pond, combined with the anti-pollution non-return valve on the Fuel Farm drainage system and appropriate monitoring of the clean pond outflow. The regulation of the quality of all discharges to Pegwell Bay will be discussed with the EA and NE prior to the commencement of works.

4.2.4.48 The appropriate design of the Site drainage system, the regulation of the Site discharge through an environmental permit and the design of the outfall discharge mean that all effects on Pegwell Bay from the Site discharge are concluded to be negligible during the operation phase. Therefore, it is envisaged that there will be no adverse effects on the habitats golden plover utilise for roosting in Pegwell Bay, and therefore no adverse effects on the integrity of the SPA due to the outfall during operation.

4.2.5 In-combination Effects

4.2.5.1 Other developments and plans within the local area also have the potential to adversely affect the SPA population of golden plover due to habitat loss through land-take and disturbance. None of the developments and plans identified in the shortlist in **Chapter 18: Cumulative Effects** of this ES are predicted to lead to the loss of potentially important areas of suitable foraging and roosting habitat (farmland) for golden plover that might be considered as functionally linked habitat to the SPA, due to land-take or disturbance to birds foraging/ resting adjacent farmland. These developments are not located in close vicinity to areas where important concentrations of golden plover are known to utilise farmland and therefore are not predicted to cause high levels of disturbance.

4.2.5.2 A number of developments and plans identified within the short list in **Chapter 18: Cumulative Effects** (of this ES) however, include new residential housing, in particular: Manston Green (OL/TH/14/0050) and Land off New Haines Road (OL/TH/11/0910) which each propose the construction of several hundred new homes. In addition, TDC have identified land for a further 4,875 dwellings in nine separate areas (IDs A-I, see **Figure 18.1** and **Table 18.2** in **Chapter 18: Cumulative Effects**). These developments and plans have the potential to have an adverse effect on the four European sites identified in **Table 4.1** due to increased disturbance from residents visiting these sites for recreational purposes. Disturbance to birds by dog walkers using Pegwell Bay has been highlighted as a major issue for the Thanet Coast and Sandwich Bay SPA. This increased human disturbance also has the potential to adversely impact on golden plover roosting in Pegwell Bay.

4.2.5.3 The Competent Authority must comply with Regulation 63 of the Habitats Regulations, as set out below:

> "63(5). *In the light of the conclusions of the assessment, and subject to regulation 64, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).*"

4.2.5.4 If a project is likely to have an adverse effect on a European site (for example, due to disturbance to qualifying bird species due to increased numbers of residents visiting the SPA from a proposed new housing development), to comply with the Habitats Regulations, the applicant must provide a HRA report as part of the application documentation (see **Sections 1.1 and 1.2**). The HRA report must show the European site(s) potentially affected, alongside sufficient information to enable the Secretary of State to make an appropriate assessment, if required. If applicable, this would need to include measures to mitigate against the effects of increased human disturbance to birds. Typically, such measures would include the provision of on-site green space (for dog walking etc) and/or contribution to management measures within the SPA to reduce disturbance or control access.

4.2.5.5 The Hacklinge Marshes to Sandwich Bay SSSI is also notified for its non-breeding population of golden plover and forms a constituent SSSI of the Thanet Coast and Sandwich Bay SPA. Paragraph 118 of the National Planning Policy Framework (NPPF)[36] states:

- "*When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*
  - *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;*
  - *Proposed Development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*"

4.2.5.6 In view of the requirements of the NPPF and Habitats Regulations, any planning applications for development, including those for new residential housing (such as those identified in the short list in **Chapter 18: Cumulative Effects** of this ES) would be required to provide suitable mitigation as detailed above. For example, the Manston Green development, includes a strategy to contribute towards SPA management and Monitoring; and provide additional natural green space / Suitable Alternative Natural Green Space (SANGS) within the site to mitigate against the effects of human disturbance to the Thanet Coast and Sandwich Bay SPA.

4.2.5.7 To conclude, no adverse effects on the integrity of the SPA is predicted due to the in-combination effects of other developments and plans on the SPA golden plover population.

4.3 Thanet Coast and Sandwich Bay SPA – Little Tern (Breeding)

4.3.1 Current Baseline

4.3.1.1 Little tern is a qualification feature of the Thanet Coast & Sandwich Bay SPA. It qualifies under Article 4.1 of the *Birds Directive* as during the breeding season, the area regularly supports 0.3% (five-year mean, 1992-1996) of the breeding population of Great Britain. Following the third JNCC review (Stroud *et al*. 2016) of the SPA designated species, it was suggested little tern be removed, due to recent absence from the SPA, although this change is as yet unratified.

4.3.1.2 The conservation objectives for the SPA little tern population are provided in **Appendix D**, and are in summary: to maintain and restore the population and distribution of little tern, and the habitats and supporting processes they depend upon.

[36] Communities and Local Government (CLG) (2012) *National Planning Policy Framework*, CLG, London.

4.3.1.3 Little tern almost exclusively occurs in coastal habitats, nesting and foraging along shorelines and beaches. The Order Limits and surrounding farmland provides no opportunities for foraging, resting or nesting little tern, and therefore the species is unlikely to occur in this area.

4.3.1.4 Little tern no longer breeds within the Thanet Coast & Sandwich Bay SPA. The species has also ceased to breed on a regular basis in Kent, with no records of nesting mentioned in the latest Kent bird report, in 2014 (Privett [ed.], 2016). Little tern previously bred at a number of locations along the Kent coast, including on the Swale Estuary and on Shellness (on the Isle of Sheppey), Dungeness (on the south coast), near Plumpudding Island on the North Thanet coast and on Shell Ness in Sandwich Bay (Taylor *et al*., 1984). During high tide, little terns from the colony at Shell Ness, in Sandwich Bay (at its closest 2.5km south of the airport runway) were known to forage in the shallow coastal waters of Pegwell/ Sandwich Bay and in the lower part of the River Stour.

4.3.2 Future Baseline

4.3.2.1 In the absence of development, it is assumed that the Order Limits will remain principally as grassland and hard standing and the land in the immediate vicinity will remain primarily as arable farmland. As a result, the management of this area would be unlikely to change in the foreseeable future and therefore the baseline with respect to the little tern population of the Thanet Coast and Sandwich Bay SPA and Ramsar site, and its potential recolonization, would not be altered significantly.

4.3.3 Predicted Adverse Effects

Operational disturbance - breeding failure due to the noise from aircraft flights

4.3.3.1 Although little tern no longer breeds around Pegwell Bay, assessment is made in order to determine whether the Proposed Development could prevent little tern from re-establishing itself as a breeding species within the SPA. Once the airport is operational, there is potential for any nesting little terns to be displaced from coastal habitats (used for nesting and foraging) below or near to the flight paths of planes. The altitude, lateral distance and noise of the aircraft are all factors involved in potential disturbance, although separating the effect of aircraft noise from that of visual disturbance is difficult.

4.3.3.2 Most of the documented evidence on the visual and auditory disturbance effects of aircraft on birds comes from studies that have focussed on geese, ducks, swans and seabirds. Also, these studies have mainly been based upon effects associated with aircraft altitude rather than lateral distance.

4.3.3.3 A literature review was undertaken by Amec Foster Wheeler on bird disturbance by aircraft (**Appendix 7.4** in **Chapter 7: Biodiversity** of this ES). Results from this literature review and other studies indicate that beyond distances of 500m in altitude and 1km ground-level, lateral distance, little tern is unlikely to be disturbed by the visual presence of flying aircraft other than helicopters (see **Table 3.1**).

4.3.3.4 An indicative figure of locations overflown by aircraft below 500m is shown in **Figure 4.6**. It should be noted that no aircraft are currently operating from the Order Limits and therefore the figure is based on indicative vertical climb profiles, operating procedures and flight paths. The actual procedures and flight paths will be consulted on after the DCO through the CAA's Airspace Change Process (ACP); the ACP will provide opportunities for engagement with local communities and other stakeholders. The ACP will likely follow the process outlined in the draft ACP guidance CAP1520 (CAA, 2017). Given, the very limited options for any change in the flight routes to the east of the airfield, north of Pegwell Bay, it is inconceivable that the routes would pass within 1km of potentially suitable nesting habitat for little tern.

4.3.3.5 Results from the literature review (**Appendix 7.4, Chapter 7: Biodiversity** of this ES) indicate that noise levels in excess of 80 dB[37] L_{Amax}[38] (peak noise levels) have been recorded as causing the more severe disturbance incidents in a number of studies, primarily in duck species. There is also evidence from the literature review to indicate that breeding terns are relatively tolerant of aircraft flights. The information provided for the application to expand London Ashford Airport, highlighted no evidence to indicate that the colony of Sandwich and common terns breeding on Burrowes Pits, close to the operational airport had been adversely affected by high noise levels from over-flying aircraft, of 90-95 dB LAmax (London Ashford Airport, 2012). The review of case studies presented in **Table 1.2 in Appendix 7.4**, shows that there has been no recorded adverse effects on the breeding populations of little tern on the Wash, North Norfolk Coast or Firth of Tay and Eden SPAs, despite the close proximity of airports, and regular over-flight by military aircraft.

4.3.3.6 The area of land (at ground level) where noise levels in excess of 80 dB L_{Amax} are predicted (during peak periods of operation of the Proposed Development) during the day (07:00 to 23:00 hrs) and night (23:00 to 07:00 hrs) are shown in **Figures 4.1a and 4.1b** respectively, and where noise levels are in excess of 70 dB L_{Amax} shown on **Figures 4.2a and 4.2b** respectively. The different coloured shaded areas denote the mean number of events per day (due to aircraft movements), where peak noise levels of 80 and 70 dB L_{Amax} will be exceeded (respectively), taking into account the proposed flight paths, and combination of different aircraft types/ models that are planned to be in operation in Year 20 when the number of flights will have reached their anticipated peak (worst case scenario). For example, in **Figure 4.2a**, any birds foraging on land within the outermost shaded area (in light pink) are predicted to experience an average of 10-19 single noise events per day (due to aircraft flights) that exceed 70 dB L_{AMAX} during Year 20.

4.3.3.7 Little tern is a coastal species and does not use farmland and as such, available nesting areas do not occur within the area where 70 dB L_{Amax} is exceeded. Potentially suitable habitat (shingle/stony beaches) available for nesting for little tern, the closest of which is on Shell Ness on the southern edge of Pegwell Bay are located outside the area where aircraft are predicted to fly over at altitudes of less than 500m (see **Figure 4.6**) and are at their closest, 2.5km from the airport runway (well beyond the 1km ground-level, lateral disturbance distance). In view of this, the effects of noise and visual presence from aircraft in deterring little tern from re-colonising the SPA are considered negligible and would not adversely affect the integrity of the SPA.

4.3.4 In-combination Effects

4.3.4.1 Other developments and plans within the local area also have the potential to adversely affect little tern to breed within the SPA due to disturbance from aircraft. None of the proposed or consented developments and plans identified and listed in **Table 18.2** in **Chapter 18: Cumulative Effects** of this ES are sufficiently close to potential little tern nesting sites to directly result in disturbance.

4.3.4.2 A number of developments and plans identified within the shortlist in **Chapter 18: Cumulative Effects** of this ES however, include new residential housing, in particular: Manston Green (OL/TH/14/0050) and Land off New Haines Road (OL/TH/11/0910) which each propose the construction of several hundred new homes. In addition, TDC have identified land for a further 4,875 dwellings in nine separate areas (IDs A-I, see **Figure 18.1** and **Table 18.2** in **Chapter 18: Cumulative Effects** of this ES). These developments and plans have the potential to have an adverse effect on the nearby European sites (and constituent SSSI) with bird interest due to increased disturbance from residents visiting these sites for recreational purposes. Disturbance to birds by dog walkers using Pegwell Bay has been highlighted as a major issue for the Thanet Coast and Sandwich Bay SPA. This increased human disturbance also has the potential to adversely impact on little tern should the species attempt to breed around Pegwell Bay.

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[37] The ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. Due to this wide range, a scale based on logarithms is used in noise level measurement. The scale used is the decibel (dB) scale which extends from 0 to 140 dB corresponding to the intensity of the sound pressure level.
[38] L_{Amax} is maximum recorded noise level during the measurement period.

4.3.4.3 In view of the NPPF and Habitats Regulations (detailed in **Section 4.2.5**), no in-combination effects due to increased visitor disturbance preventing little tern from re-colonising the SPA are predicted. In view of this, no in-combination adverse effects on the integrity of the SPA due to effects on little tern are anticipated.

4.4 Thanet Coast and Sandwich Bay SPA/ Ramsar - Turnstone (Non-Breeding)

4.4.1 Current Baseline

4.4.1.1 The Thanet Coast and 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.

4.4.1.2 The two constituent SSSIs for the SPA are: the Thanet Coast SSSI and the Sandwich Bay to Hacklinge Marshes SSSI. The Thanet Coast SSSI is partly notified for its nationally important non-breeding population of turnstone. Turnstone is not a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI though the intertidal habitats in Units 1 and 4 of the SSSI are known to be used by roosting turnstone. Both units are described by Natural England as being in a 'Favourable' condition, with Unit 1 containing undisturbed littoral habitat (rocky beach) in good condition.

4.4.1.3 The conservation objectives for the SPA turnstone population are provided in **Appendix D** and are in summary: to maintain and restore the population and distribution of turnstone and the habitats and supporting processes they depend upon.

4.4.1.4 Turnstone occur almost exclusively in coastal habitats, foraging and resting on rocky shorelines and beaches, and will also forage along the tidelines on sandy beaches and on mudflats. The Order Limits and surrounding farmland provide no opportunities for foraging or resting turnstone, and therefore the species is unlikely to occur in these areas on a regular basis.

4.4.1.5 The Thanet Coast Turnstone Monitoring Report (Hodgson, 2016) concluded from six surveys undertaken between 2001 -2010 that the population of turnstone within the SPA varied from 1,087 to 1,335 birds, with a mean of 1,227. A coordinated count in 2013 showed a marked decline, with 620 turnstone counted. Further coordinated counts in winter 2013/14 (two counts) and latterly in 2016 (single count) confirmed this decline, with 583, 664 and 537 birds recorded respectively.

4.4.1.6 It was suggested in Hodgson (2016) that prior to high tide, the turnstones from the Thanet Coast and Sandwich Bay SPA flew to join a roost, 2.5km west of Whitstable Harbour on the north Kent coast, within the Swale SPA and some 18km north-west of the Order Limits. This suggestion was based on results from coastal survey plots. It would therefore appear that the birds, as would be expected for this species, are following the coastline around Thanet and not undertaking any overland movements.

4.4.1.7 WeBS Core Count Survey results indicate that turnstone concentrations within the Thanet Coast and Sandwich Bay SPA occur mainly across the northern extremities of the SPA, heading west toward Whitstable, with Pegwell Bay supporting only a small proportion of the numbers mentioned here. **Table 4.4** shows the peak counts of turnstone each winter, obtained from the WeBS core count data, including additional counts obtained outside the standardised WeBS visit dates. Data for the Thanet Coast WeBS count sectors is very incomplete for the two most recent seasons for which data is available (2013/14 and 2014/15) and has therefore not been included (Frost *et al*. 2017, and https://app.bto.org/webs-reporting/, accessed 4 December 2017).

Table 4.4 Peak Counts of Turnstone from 2008/09 – 2012/13 for Pegwell Bay and the Thanet Coast

	2008/09	2009/10	2010/11	2011/12	2012/13

Pegwell Bay	130	927	90	65	70
Thanet Coast	722	624	529	396	360

NB: Pegwell Bay includes the WeBS count sector 22412 (which also includes Sandwich Bay). Thanet Coast includes data for WeBS count sectors: 22417, 22418, 22420, 22431 and 22432[39].

4.4.1.8 During the Pegwell Bay Distribution Survey (**Appendix 7.5** in **Chapter 7: Biodiversity** of this ES), relatively low numbers of turnstone were recorded, with flocks of roosting and foraging birds primarily seen on intertidal habitat along the northern and north-western fringe of Pegwell Bay, near the high-water mark. The largest count of foraging turnstone was of 54 individuals on the northern fringe of Pegwell Bay on 13 October 2016, and of roosting birds, 28 on the western fringe on 14 March 2017. **Figure 4.7** shows the location of the peak counts of turnstone recorded in each 500m grid square.

4.4.2 Future Baseline

4.4.2.1 In the absence of development, it is assumed that the Order Limits will remain principally as grassland and hard standing and the land in the immediate vicinity will remain primarily as arable farmland. As a result, the management of this area would be unlikely to change in the foreseeable future and therefore the baseline with respect to the turnstone population of the Thanet Coast and Sandwich Bay SPA and Ramsar site would not be altered significantly.

4.4.3 Predicted Adverse Effects

Operational displacement - habitat loss due to aircraft flights

4.4.3.1 There is the potential for foraging and roosting turnstone in Pegwell Bay to be adversely affected by auditory and visual disturbance caused by over-flying aircraft, and aircraft departing from and arriving at the airport.

4.4.3.2 Results from the desk study (**Appendix 7.2** in **Chapter 7: Biodiversity** of this ES) and the Pegwell Bay Distribution Survey (**Appendix 7.5** in **Chapter 7: Biodiversity** of this ES) indicate that turnstone do not utilise intertidal habitats for foraging and roosting within the area where 70 dB $_{LAmax}$ is exceeded (see **Figures 4.2a and 4.2b**), or where aircraft fly over at altitudes of less than 500m (see **Figures 4.6 and 4.7**). In addition, the main foraging and roosting areas for turnstone in Pegwell Bay are located more than 1km from the airport runway. There is no historical evidence to suggest that turnstone were displaced from areas of Pegwell Bay close to the flight paths during the period when Manston airport was operational, and conversely, numbers of turnstone have declined since operation ceased (Hodgson, 2016).

4.4.3.3 It is acknowledged that there is very little information within the literature review (**Appendix 7.4 in Chapter 7: Biodiversity** of this ES) related specifically to the visual and auditory effects of aircraft flights on turnstone. In view of this, the assessment has drawn on information from case studies and from studies relating to the effects of human disturbance (for example, from dog walkers) on this species.

4.4.3.4 The review of case studies presented in **Table 1.2 in Appendix 7.4**, shows that there have been no recorded adverse effects on the non-breeding populations of turnstone on the Wash, North Norfolk Coast or Belfast Lough SPAs, despite the close proximity of civil airports, and/or regular over-flight by military aircraft. In addition, in the water bird disturbance mitigation toolkit in (Cutts *et al*., 2013), turnstone is described as a species with a low sensitivity to disturbance that is extremely tolerant to disturbance and that habituates rapidly. This study also cites, amongst others, turnstone

[39] Details of the locations and coverage of the WeBS count sectors can be found at https://app.bto.org/websonline/sites/vacant/vacant-sites.jsp?wide_region=3#wide_region=3

not reacting to noise levels in excess of 90 dB L_{AMAX} due to piling during construction works, indicating a tolerance to high noise levels.

4.4.3.5 There is also evidence to indicate that turnstone will readily habituate to other types of disturbance, in particular, to the presence of humans (Cutts *et al*., 2009) and that this species does not flush (fly away) until approached at very close distance (Borgmann 2010, Smith & Visser 1993, Holloway 1997). Borgmann (2009) recorded an average distance at which wintering turnstone were flushed due to walkers of only 12m (the equal lowest value of all the species studied). Smit & Visser (1993) in their studies on the effects of human-related disturbance on waders and wildfowl in the Wadden Sea found that turnstone were flushed due to human presence at an average distance of 47m (compared to 211m for curlew), the lowest value of the nine species studied. Results from disturbance studies on waders in Findhorn Bay (Scotland) also found that turnstone reacted to human disturbance (such as the presence of dog-walkers) at much shorter distances (in this case an average of 14m) than most other wader species (Holloway, 1997).

4.4.3.6 To conclude, there is no evidence to suggest that turnstone will be disturbed by noise or the presence of aircraft in flight from the Order Limits; the effects of displacement on this species are considered negligible. In view of this, no adverse effect on the integrity of the Thanet Coast and Sandwich Bay SPA and Ramsar Site due to disturbance/ displacement of turnstone as a result of disturbance from aircraft flights is predicted.

Construction and Operational displacement - habitat loss due to damage to roosting site caused by outfall

4.4.3.7 There is the potential for direct effects to the foraging habitat and roosting sites of turnstone from the discharge of treated water to Pegwell Bay during the construction and operational phase of the Proposed Development. There is also potential for the discharge to adversely affect the habitats that turnstone rely upon, through scour at the point of discharge.

4.4.3.8 Following the incorporation of the environmental measures (as set out for golden plover, in Paragraphs 4.2.4.35 to 4.2.4.41 inclusive (during construction) and Paragraphs 4.2.4.42 to 4.2.4.48 inclusive (during operation), it is concluded that all effects on Pegwell Bay due to the outfall will be negligible. Therefore, it is concluded that there will be no adverse effects on the habitats utilised by turnstone in Pegwell Bay, and no adverse effect on the integrity of the SPA or Ramsar site due to the outfall during construction and operation of the Proposed Development.

4.4.4 In-combination Effects

4.4.4.1 None of the proposed or consented developments and plans identified and shortlisted in **Table 18.2** in **Chapter 18: Cumulative Effects** of this ES are predicted to lead to the loss of potentially important areas of suitable foraging and roosting habitat (intertidal mudflats and rocky shores) for turnstone. These developments and plans are either not located in close vicinity to areas where important concentrations of turnstone are known to occur, or are of a sufficiently small-scale (for example, ID127 in **Table 18.2, Chapter 18: Cumulative Effects** of this ES), and therefore are not predicted to cause high levels of disturbance.

4.4.4.2 In view of the NPPF and Habitats Regulations (detailed in **Section 4.2.5**), no in-combination effects due to increased visitor or other sources of disturbance to turnstone are predicted. To conclude, no adverse effects on the integrity of the SPA or Ramsar site are predicted due to the in-combination effects of other developments and plans on the turnstone population.

4.5 Sandwich Bay SAC – Annex I habitats

4.5.1 Current Baseline

4.5.1.1 The Sandwich Bay SAC is designated for the presence of five Annex I habitats (see **Appendix B**). The land coverage for each habitat within the SAC at its designation (in ha) has been obtained from the Natura 2000 data form (http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0013077.pdf), as follows:

- Embryonic shifting dunes (5.68ha);
- White dunes, shifting dunes along the shoreline (9.09ha);
- Grey dunes, fixed coastal dunes with herbaceous vegetation (223.93ha);
- Dunes with *Salix repens ssp. Argentea* (11.37ha); and
- Dune slacks (7.96ha).

4.5.1.2 The conservation objectives for the qualifying Annex I habitat features of the SAC are provided in **Appendix D**, and are in summary: to maintain and restore the extent, distribution, structure and function of these habitats (including the typical species of plant they comprise) and supporting processes they depend upon.

4.5.1.3 The precise locations of each of the five Annex I habitat types within the SAC is not known, though the description for the SAC indicates the presence of the embryonic and white dunes to be primarily along the seaward side within the northern half of the Order Limits. However, the overall extent of the 'sand dune' Habitat of Principal Importance [HPI]' (covering approximately 368ha) has been obtained from http://magic.defra.gov.uk/ and is shown on **Figure 4.8**. In view of this, the sand dune features of the SAC have been treated 'as a whole', rather than separately within the assessment. A worst-case scenario has been adopted in terms of the distance of each sand dune feature to the Order Limits (i.e. the distance of all the sand dune features has been taken to be the nearest point of the sand dune HPI to the Order Limits). Given the adoption of a worst-case scenario, the treatment of the different SAC sand dunes features (as a whole, rather than separately) does not affect the overall conclusions reached in this assessment.

4.5.1.4 The Sandwich Bay SAC is legally underpinned by the Sandwich Bay to Hacklinge Marshes SSSI which covers the entirety of the SAC, plus areas of adjacent and nearby land. The SSSI is notified for a total of 31 separate features, which include a range of vegetation types, species/ species groups and habitats, including nine coastal sand dune/ adjacent strandline vegetation communities, as follows:

- SD11 - *Carex arenaria - Cornicularia aculeata* dune community;
- SD12 - *Carex arenaria - Festuca ovina - Agrostis capillaris* dune grassland;
- SD14 - *Salix repens - Campylium stellatum* dune-slack community;
- SD2 - *Honkenya peploides - Cakile maritima* strandline community;
- SD4 - *Elymus farctus ssp. Boreali-atlanticus* foredune community;
- SD6 - *Ammophila arenaria* mobile dune community;
- SD7 - *Ammophila arenaria - Festuca rubra* semi-fixed dune community;
- SD8 - *Festuca rubra - Galium verum* fixed dune grassland; and
- SD9 - *Ammophila arenaria - arrhenatherum elatius* dune grassland.

4.5.1.5 Together with a further seven vegetation communities associated with wetland, intertidal and coastal habitats:

- S4 - *Phragmites australis* swamp and reed-beds;
- SM14 - *Atriplex portulacoides* saltmarsh;
- SM16a - *Festuca rubra saltmarsh Puccinellia maritima* sub-community;
- SM18 - *Juncus maritimus* saltmarsh;
- SM21 - *Suaeda vera - Limonium binervosum* saltmarsh;
- SM24 - *Elytrigia atherica* saltmarsh; and

- SM9 - *Suaeda maritima* saltmarsh.

4.5.1.6 The SSSI covers an area of 1,790ha, of which: 94% is in a 'Favourable' (50%) or 'Unfavourable - recovering' (46%) condition. The SSSI is divided into 62 units of which at least 12 Units (numbered 13-15, 17-19, 21-23, and 25-27 inclusive) contain sand dune habitat: ten in a 'Favourable' Condition, and two in an 'Unfavourable – Recovering' Condition (Units 18 and 22).

Current baseline (air quality)

4.5.1.7 The overall air quality baseline is detailed in **Chapter 6: Air Quality** of this ES**,** with a summary provided here.

4.5.1.8 Thanet's measured annual mean nitrogen dioxide (NO_2) monitoring programme between 2007 and 2016 showed that concentrations above 20 µg m^{-3} are confined to roadside and urban centre locations. There is a modest decreasing trend at most monitors, averaging roughly 1 µg m^{-3} per year, which is consistent with trends elsewhere in the UK.

4.5.1.9 For context, the legal limit for annual mean NO_2 concentrations is 40 µg m^{-3}. The monitoring shows that at rural and urban background locations, concentrations are well below the legal limit. There are some exceedances of the legal limit alongside busy roads. These results are typical of such locations in England.

4.5.1.10 Measured annual mean NO_x concentrations from Thanet's monitoring programme between 2007 and 2016 and monitor locations are detailed in **Appendix 6.2** in **Chapter 6: Air Quality** of this ES.

4.5.1.11 Measured annual mean PM_{10} concentrations from Thanet's monitoring programme between 2007 and 2016 are detailed in **Appendix 6.2** in **Chapter 6: Air Quality** of this ES. These are both roadside sites. The monitoring shows that at the monitoring locations, concentrations are well below the legal limit of 40 µg m^{-3}.

4.5.1.12 The Department for Environment, Food and Rural Affairs (Defra) maintains a nationwide model (the Pollution Climate Mapping (PCM) model) of existing and future background air quality concentrations at a 1km grid square resolution. The datasets include annual average concentration estimates for NO_x[40], NO_2, PM_{10} and $PM_{2.5}$[41], as well as other pollutants. The datasets were updated in 2016.

4.5.1.13 Measured NO_2 concentrations at non-roadside monitors are compared with the Defra concentrations (both for 2016) for the corresponding grid square (see **Chapter 6: Air Quality** of this ES). The measured concentrations are consistently higher than the Defra concentrations, by 3 to 9 µg m^{-3}. This is partly because the monitoring results for 2016 were unusually high, due to prevailing meteorological conditions, something which cannot be taken into account in the forecasting models. The magnitude of this difference is broadly consistent with comparisons in other parts of the country for similar air quality assessments, although the Margate urban background monitor (ZH2) shows an unusually large discrepancy.

APIS background mapped deposition rates

4.5.1.14 The Air Pollution Information System (APIS) website[42] provides information on background deposition of nitrogen and sulphur at sensitive ecological sites in the UK. APIS is widely recognised as the primary source of this information and will be used for the air quality assessment.

[40] Nitrogen oxides were taken to be nitrogen dioxide (NO_2) + nitrogen/nitric oxide (NO). NO and NO_2 are collectively known as NOx
[41] PM_{10} is particulate matter 10 micrometres or less in diameter, $PM_{2.5}$ is particulate matter 2.5 micrometres or less in diameter. $PM_{2.5}$ is generally described as fine particles.
[42] www.apis.ac.uk

4.5.2 Future Baseline

4.5.2.1 There is a slight trend in the air quality monitoring data for concentrations to reduce over the years. This trend will be ignored for conservatism. The future baseline will therefore be assumed to be the same as the current baseline. For near-road locations, the projected Defra maps will be used for consistency across the roads methodology.

4.5.2.2 No information is available on future deposition rates, so these too will be assumed to be the same as the current baseline.

4.5.2.3 Committed developments have been reviewed to identify additional sources of emissions that are likely to arise in future. The main new developments of relevance are residential, which may generate additional road traffic. These have been included in the traffic model. No other developments have been identified which are likely to have an adverse effect on air concentrations at receptors close to the Proposed Development.

4.5.3 Predicted Adverse Effects

4.5.3.1 There is potential for direct effects resulting from a deterioration in air quality. Plant and equipment used during construction, as well as road traffic generated during the construction phase, will produce emissions. During operation, emissions will result from aircraft and airside plant and equipment; and road traffic generated during the operation phase.

4.5.3.2 The principal pollutant of concern associated with emissions that might affect sensitive habitats is nitrogen oxide[43] (NO_x). Road and air traffic emissions may increase the ambient NO_x concentrations in the air to which vegetation is exposed. The air quality standard measurement used for NO_x concentrations in air is the annual mean and the daily mean.

4.5.3.3 In addition to NO_x concentrations in air, NO_x emissions may also, following chemical conversion in the air, form NO_2, which is then deposited. This nitrogen deposition may affect plant communities (with the consequent potential to alter habitats) by causing:

i. Nutrient enrichment of soils; and

ii. Acidification of soils.

4.5.3.4 The strongest effect of NO_x emissions is through their contribution to nitrogen deposition (either through nutrient enrichment or acidification) rather than through the NO_x concentrations in air. Furthermore, there is substantial evidence to suggest that the effects of ambient nitrogen are much more likely to be negative in the presence of equivalent concentrations of SO_2, with the ratio of SO_2 to NO_2 having decreased greatly in the UK over the past 30 years[44]. Ozone (O_3) has a similar effect to SO_2. Ozone has also decreased and in 2016 for the UK "*all zones and agglomerations met the target values for health and for protection of vegetation*"[45]. There is also a long-term objective for the protection of vegetation from O_3. In 2016 the south-east of England was below this long-term objective for the protection of vegetation[46]. In terms of potential impacts upon ecological receptors this means that any elevated levels of NO_x concentrations in air are unlikely to have negative impacts when levels of SO_2 and O_3 are also low.

4.5.3.5 The EA and Institute of Air Quality Management (IAQM) has specific guidance for ecological receptors.

[43] Assessment of sulphur oxides (SO_2) has been scoped out as such emissions are expected to be negligible (see **Chapter 6, Section 6.4**).
[44] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm
[45] Defra, Air Pollution in the UK 2016. September 2017: https://uk-air.defra.gov.uk/assets/documents/annualreport/air_pollution_uk_2016_issue_1.pdf
[46] Five zones (Yorkshire and Humberside, the West Midlands, the North-East, South Wales and North Wales) were above the long-term objective for vegetation in 2016 (Defra, Air Pollution in the UK 2016. September 2017).

4.5.3.6 The EA[47] guidance gives criteria for screening outsource contributions at designated nature conservation sites. For SSSIs, SPAs, SACs and Ramsar sites, there is no need for further assessment if the screening calculation finds that:

- Both the following are met:
  - The short-term Process Contributions (PC)[48] is less than 10% of the short-term AQAL[49]; and
  - The long-term PC is less than 1% of the long-term AQAL;
- Or:
  - The long-term Predicted Environment Contributions (PEC) is less than 70% of the long-term AQAL.

4.5.3.7 Following detailed dispersion modelling, no further action is required if:

- The proposed emissions comply with Best Available Technique (BAT) associated emission levels (AELs) or the equivalent requirements where there is no BAT AEL; and
- The resulting PECs won't exceed AQALs.

4.5.3.8 The critical level for all vegetation types from the effects of NO_x has been set to 30 µg/m^3 [50].

4.5.3.9 The full scope of the air quality assessment, the air quality baseline, assessment methodology and assessments (covering both ecological and human receptors) are detailed in **Chapter 6: Air Quality** of this ES. The criteria for the spatial identification of ecological receptors is set out in **Section 6.4** of **Chapter 6: Air Quality** of this ES, with the receptors detailed in **Table 6** and their location shown in **Figure 6.5** (those near the Proposed Development) and **Figure 6.6** (those further away from the Order Limits).

4.5.3.10 The air quality assessment has been based upon three operational years, two of which also cover the construction phase, as follows:

- Year 2, representing the first year of aircraft operation;
- Year 6 (the point at which the airport exceeds 10,000 movements per year); and
- Year 20, representing the worst-case year in terms of likely emissions from aircraft and vehicular movements.

4.5.3.11 Construction activity will be spread over the first 18 years of the Proposed Development, but is conservatively assumed to be condensed into Years 2 and 6 (with construction completed before Year 20). This approach has ensured that the assessment has captured the peak construction years as well as the worst-case operational year.

4.5.3.12 Throughout the air quality modelling process, care has been taken not to risk under-predicting impacts. In fact, a number of conservative assumptions have been made (see **Appendix 6.3, Chapter 6: Air Quality** of this ES) for a summary list of conservative assumptions) which mean that impacts are very likely to be over-predicted, that is to say the air quality assessment is very much a worst-case assessment.

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[47] Environment Agency (2016). 'Air emissions risk assessment for your environmental permit'. https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit, dated 2 August 2016.
[48] The predicted concentrations resulting from the process (i.e. the process contribution (PC)) are used along with background concentrations and the percentage contribution that the predicted environmental concentrations (PEC) would make towards the relevant standard, objective or guideline value (see **Chapter 6**).
[49] AQAL = Air quality assessment level. A generic term to embrace air quality standards, air quality objectives, targets, limit values, critical levels, critical loads, etc. This term is promulgated by IAQM/Environmental Protection UK.
[50] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. Transposed into UK law as the Air Quality Standards Regulations: Statutory Instrument 2010 No. 1001. Environmental Protection: The Air Quality Standards Regulations 2010.

4.5.3.13 For daily mean NO_x concentrations in air and acid deposition no further assessment of any ecological receptors has been undertaken as the air quality assessment (see **Appendix 6, Chapter 6: Air Quality** of this ES) showed that effects were predicted to be not significant for each of the three assessment years (Years 2, 6 and 20) for all relevant ecological receptors.

4.5.3.14 **Chapter 6: Air Quality** of this ES also includes an assessment of air quality effects from roads away from the airport covering each of the three assessment years (see **Section 6.11, Chapter 6**). This concludes that any effects from the Proposed Development via NO_x concentrations in air, nutrient nitrogen deposition and acid deposition are not significant on valued ecological receptors in all years. Therefore, no further assessment is included in this chapter for any effects away from the airport in relation to emissions generated by road traffic.

Construction and operation phase effects (Year 2)

4.5.3.15 This is the second year of construction activity and the first year of aircraft operation. This section is based upon the results of the air quality modelling described in **Section 6.8, Chapter 6: Air Quality** of this ES.

4.5.3.16 Consideration is given to those ecological receptors identified in the air quality assessment that require further assessment for annual mean NO_x concentrations in air, as identified by the air quality assessment (**Chapter 6: Air Quality** of this ES).

4.5.3.17 For Year 2, the air quality assessment shows that further consideration is required for one receptor (located adjacent to the Sandwich Bay SAC) for annual mean NO_x concentrations in air. This receptor is E22[51] (see **Figure 6.5 in Chapter 6**). Receptor E22 is located approximately 2km north of the closest part of the qualifying sand dune features of the SAC (see **Figure 4.8**), though they are adjacent to the littoral habitats within the SAC, which are frequently and regularly covered by seawater through tidal action. Much of these habitats are unvegetated rock and sediment with no impact from elevated NO_x concentrations in air. Where vegetated, the habitats have low sensitivity to nitrogen (Van Dobben *et al*., 2012) and are covered by eutrophic tidal waters. In addition, for NO_x concentrations in air to have negative effects on vegetation, there has to be corresponding levels of SO^2 and O^3 and "*The level for NOx should only be applied where levels of SO_2 and O_3 are close to their critical levels*"[52] with levels of SO^2 and O^3 are below critical levels/threshold in Thanet[53].

4.5.3.18 The air quality assessment assumed background (existing) NO_x at rural locations in Thanet to be 25.9 µg m^{-3}, based on monitoring at two suburban/ edge-of-town sites. Therefore, actual concentrations at the SAC will probably be somewhat lower. At the nearest point of the SAC, the Proposed Development will add up to 0.9µg m^{-3} of NO_x, giving a total concentration of 26.8 µg m^{-3}. The increase here is 3% of the AQAL and therefore above the 1% EA screening threshold (see **Section 4.5.3.6)**. However, the total concentration is still below the 30 µg m^{-3} critical level (see **Section 4.5.3.8**) level for all vegetation types from the effects of NO_x.

4.5.3.19 Therefore, although the additional contribution of NO_x in Year 2 would be above the 1% EA screening threshold, the total concentration will remain below the critical level for these habitats and therefore there would be no adverse effect on the integrity of the Thanet Coast SAC.

Construction and operational effects (Year 6)

4.5.3.20 This is the sixth year of construction activity and the year when the airport exceeds 10,000 air traffic movements a year. This section addresses the results of the air quality modelling described in **Section 6.9** of **Chapter 6: Air Quality** (of this ES), which, as in Year 2, shows that any effects

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[51] The prefix 'E' denotes 'ecological' used in the air quality assessment to differentiate from human receptors.
[52] http://www.apis.ac.uk/
[53] Defra, Air Pollution in the UK 2016. September 2017: https://uk-air.defra.gov.uk/assets/documents/annualreport/air_pollution_uk_2016_issue_1.pdf

from nutrient nitrogen and acid deposition are not significant (see also **Appendix 6, Chapter 6: Air Quality** of this ES).

4.5.3.21 Consideration is therefore given to those ecological receptors that require further assessment for annual mean NO_x concentrations in air as identified by the air quality assessment (**Section 6.9**, **Chapter 6: Air Quality** of this ES).

4.5.3.22 For Year 6, further assessment is required for receptors (that are located within or just outside the boundary of the SAC): E21 to E24 inclusive. Receptors E21-24 are located by residential and agricultural areas adjacent to the SAC but more 1.5km from the nearest sand dunes within the SAC (see **Figure 4.8** in this report, and **Figure 7.6** in **Chapter 7: Biodiversity** of this ES). No adverse effects from NO_x concentrations in air are predicted for the same reasons as stated for Year 2.

4.5.3.23 It should be emphasised that the modelled PECs are dominated by the background contribution, and it is assumed that the background concentrations are unchanged from current (2007–2016) monitored concentrations. This is a very conservative assumption, given that the monitoring data over that period shows a steady reduction in concentrations (about 1.4 µg m^{-3} per year at the ZH2 and ZH3 monitors, see **Section 6.5, Chapter 6: Air Quality** of this ES), and in fact, the assumed background concentration assumed here (25.9 µg m^{-3}, the 2007–2015 average at the two monitors) has not been exceeded since 2010. Moreover, the active measures are in place nationally and internationally to further reduce emissions from road vehicles and other sources which are expected to take effect over the next twenty years.

4.5.3.24 In addition, it should also be remembered that the modelling makes a number of worst-case assumptions about the emissions from the Proposed Development, so the PC is also likely to be overestimated.

Operational phase effects from aircraft in Year 20 (worst case)

4.5.3.25 This section presents results for Year 20, the year with the peak number of aircraft movements ('worst case') and with construction completed.

4.5.3.26 The air quality assessment (see **Section 6.10** and **Appendix 6** in **Chapter 6: Air Quality** of this ES) shows no significant effects from acid or nutrient nitrogen deposition for Year 20, therefore in this section, only the annual mean NO_x concentrations in air are considered.

4.5.3.27 The air quality assessment (see **Appendix 6, Chapter 6: Air Quality** of this ES) shows for annual mean NO_x concentrations in air, further assessment is required for the following ecological receptors (within or close to the SAC): E21 to E24 inclusive (see **Figure 6.6, Chapter 6: Air Quality** of this ES). The reasons given in the assessment in the preceding sections for Years 2 and 6 explaining no significant effect for those years are also applicable for Year 20. Therefore, no adverse effects from NO_x concentrations in air for Year 20 are predicted.

Conclusion

4.5.3.28 No adverse effects on the integrity of the Sandwich Bay SAC are predicted due to air quality changes caused by the Proposed Development, during construction or operation.

4.5.4 In-Combination Effects

4.5.4.1 There are no known other developments and plans (as identified in **Table 18.2** in **Chapter 18: Cumulative Effects** of this ES) that would combine with the minimal effects of air quality predicted (and as discussed above and in **Chapter 6: Air Quality** of this ES) from the Proposed Development in such a way as would result in adverse effects on the (sand dune) habitat features of the Sandwich Bay SAC. The developments and plans detailed in **Table 18.2** in **Chapter 18: Cumulative Effects** (of this ES) are all located more than 1km from the sand dune habitats within the SAC. Furthermore, as set out previously, DEFRA's Technical Guidance on Local Air Quality Management (Defra, 2009) states, in respect of NO_2, that:

"*concentrations fall-off rapidly on moving away from the source, and that beyond a distance of 1km from the source, NO2 is unlikely to make a significant contribution to air quality*".

4.5.4.2 To conclude, no adverse in-combination effects of air quality (in the form of nitrogen deposition and acidification) on the qualifying habitat features of the Sandwich Bay SAC (and thus, the integrity of the SAC) are predicted due to the Proposed Development.

4.6 Thanet Coast and Sandwich Bay Ramsar – Invertebrates

4.6.1 Current Baseline

4.6.1.1 The Thanet Coast and Sandwich Bay Ramsar site qualifies under Ramsar Criterion 2 by supporting 15 Red Data Book invertebrate species. The Ramsar site also qualified under Ramsar Criterion 6 for supporting internationally important numbers of non-breeding turnstone. The assessment of effects on turnstone due to aircraft noise is dealt with in **Section 4.4**.

4.6.1.2 A total of 15 Red Data Book invertebrate species associated with freshwater and brackish wetland habitats and sand dune habitats have been recorded[54] (Bratton 1991, Shirt 1987). These comprise:

- Three species listed as endangered: the weevil *Lixus vilis*, the moth *Stigmella reprentiella*, and the beetle *Bagous nodulosus*;
- Two species listed as vulnerable: the silver barred moth *Deltote bankiana*, and the dance-fly *Poecilobothrus ducalis*; and
- Ten species listed as rare: the ground-bugs *Emblethis verbasci* and *Pionosomus varius*, the damsel bug *Nabis brevis*, the dung beetle *Euheptaulacus sus*, the click beetle *Melanotus punctolineatus*, the dotted footman moth *Pelosia muscerda*, two digger wasps *Ectemnius ruficornis* and *Alysson lunicornis*, the plantbug *Orthotylus rubidus*, and the only British population of the woodlouse *Eluma purpurescens*.

4.6.1.3 The interest features (both invertebrates and turnstone) of the Ramsar site are subject to relatively limited existing pressures as outlined below:

- Impact from water diversion or extraction;
- Unspecified disturbance from human activities; and
- Overgrazing by domestic livestock.

4.6.2 Future Baseline

4.6.2.1 In the absence of development, it is assumed that the Order Limits will remain principally as grassland and hard standing and the land in the immediate vicinity will remain primarily as arable farmland. As a result, the management of this area would be unlikely to change in the foreseeable future and therefore the baseline for the Ramsar site, including the habitats on which the Red Data Book invertebrate species depend would not be altered significantly.

4.6.3 Predicted Adverse Effects

4.6.3.1 There is potential for adverse effects on the Red Data Book invertebrate species, resulting from a deterioration in air quality. The principal pollutant of concern associated with ground-based traffic

[54] In the past, the Species Status Assessment project assigned conservation status to our flora and fauna using the internationally-approved IUCN Red Data Book criteria and categories. These reviews were published in a series entitled Species Status. Some reviews had detailed data sheets, giving biological and other information relevant for conserving each species (for example, the Diptera reviews, Species Status numbers 2 and 3), while others listed the new conservation status assigned to each species, with supporting reasons and evidence for these judgements (obtained from http://jncc.defra.gov.uk/page-3352).

and aircraft emissions that might affect sensitive habitats is nitrogen oxide (NO_x[55]). Road traffic and aircraft emissions may increase the ambient NO_x concentrations to which vegetation that the invertebrates depend upon is exposed. NO_x emissions may also, following chemical conversion in the air, form NO_2, which is then deposited. This (nutrient) nitrogen deposition may affect plant communities by causing nutrient enrichment and by acidifying the soils.

4.6.3.2 Concentrations of NO_x in air are associated with adverse effects on plant growth, and are therefore included in this assessment. In addition, emissions of NO_x and SO_x to the air may result in deposition onto ecological sites, which may be sensitive to both nutrifying nitrogen and acid deposition. Emissions of SO_x are expected to be negligible (see **Section 6.4 in Chapter 6: Air Quality** of this ES), but the impact of NO_x on nutrifying and acid deposition are included in this assessment.

4.6.3.3 The precise locations of the populations of Red Data Book invertebrate species within the Ramsar site are not known, though the majority of these species are associated with habitats such as sand dunes, marshes and reedbeds, the locations of which are shown on **Figure 4.2, Appendix 7.2**. As discussed previously, though the Thanet Coast and Sandwich Bay Ramsar site is located adjacent to the Order Limits for the Proposed Development, the active part of the airport (i.e. the runways from which aircraft will be taking off and landing, and from where the source of much of the pollution will be derived) is further removed, being 1.2km from the Ramsar site boundary. The habitats on which the Red Data Book invertebrates are likely to depend upon (such as sand dunes, marshes and reedbeds) are located a considerable distance further from the run-way, with the nearest parts of the sand dune habitats being 2.8km to the south of the runway, and at least 1km from the nearest major roads.

4.6.3.4 In addition, the air quality assessment previously detailed for the sand dune habitat features of the Sandwich Bay SAC in **Section 4.5** concludes no adverse impact on the SAC, which covers broadly the same area as the Ramsar site in this location. The same conclusion can be applied to wetland habitats within the Ramsar site, which are primarily located more than 1km south of the airfield, and more than 200m from any major roads (see **Figure 4.2, Appendix 7.2**), beyond which the effects of air pollution would be negligible (see **Table 3.1**).

4.6.3.5 To conclude, the additional contribution of air-borne and deposited nitrogen (NO_x) from the Proposed Development in areas containing habitats on which the Red Data Book species of invertebrates depend (within the Ramsar site), is predicted to be negligible. In view of this, no adverse effects on the integrity of the Ramsar Site due to the effects of air quality pollution (during operation of the Proposed Development) on the qualifying invertebrate species is predicted.

4.6.4 In-Combination Effects

4.6.4.1 There are no known other developments and plans (as identified in **Table 18.2** in **Chapter 18: Cumulative Effects** of this ES) that would appear likely to combine with the minimal effects of air quality predicted from the Proposed Development in such a way as would result in an adverse effect on the habitats upon which the Red Data Book invertebrate species depend (primarily sand dunes and wetland habitats). The other developments and plans detailed are all either located more than 1km from the wetland and sand dune habitats within the Ramsar site (see **Figure 4.2** in **Appendix 7.2, Chapter 7: Biodiversity** of this ES), or whose contribution to air quality impacts are likely to be negligible due to their small-scale or proposed activity. No adverse in-combination effects on the integrity of the Ramsar site due to air quality pollution caused by the Proposed Development are predicted.

[55] Nitrogen oxides were taken to be nitrogen dioxide (NO_2) + nitrogen/nitric oxide (NO).

5. Conclusions

5.1.1.1 Based on the results of the above HRA screening exercise (Stage 1 in **Section 3**) and information provided to permit Appropriate Assessment (Stage 2, in **Section 4**), taking account of the nature, magnitude and scale of the Proposed Development, along with the stated conservation objectives and known sensitivities of the habitats and species associated with the European sites identified within this document, it is concluded that the Proposed Development will result in no adverse effects on the integrity of these sites. As such, it is considered that no further consideration of HRA Stage 3 (Assessment of Alternatives) and Stage 4 (Consideration of Imperative Reasons of Over-riding Public Important) for the Proposed Development by the Competent Authority are required under the Habitats Regulations.

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Appendix A
Screening Matrices (Stage 1)

Potential Impacts

Potential impacts upon the European sites, which are considered within this document during the Stage 1, screening exercise, are provided in **Table A.1** below. Impacts have been grouped (and a keyword provided in parenthesis) where appropriate for ease of presentation.

Table A.1 Impacts Considered within the Screening Matrices

Designation	Impacts in submission information	Presented in screening matrices as
Thanet Coast and Sandwich Bay SPA **Thanet Coast and Sandwich Bay Ramsar** **Thanet Coast SAC** **Sandwich Bay SAC** **Outer Thames Estuary ~~Marine~~ SPA** **Margate & Long Sands ~~SCI (Inshore Marine)~~SAC** **Stodmarsh SPA** **Stodmarsh SAC** **Stodmarsh Ramsar** **Blean Complex SAC**	The introduction of toxic pollutants or sediments resulting in loss of, or damage to terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the European sites from the currently operational outfall, during construction and operation.	**Effect 1 (outfall)**
	Disturbance / displacement of birds (that are qualifying features of the SPAs/Ramsar sites, located within either the SPAs/Ramsars or on functionally linked habitat outside these sites), resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing during operation.	**Effect 2 (aircraft)**
	Deposition of oxides of nitrogen from aircraft emissions and concentrations of NOx in air (during operation) and road vehicles (during construction and operation) resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in direct or indirect effects on designated features.	**Effect 3 (AQ)**
	Disturbance / displacement of birds (that are qualifying features of the SPAs/Ramsar sites, located within either the SPAs/Ramsars or on functionally linked habitat outside these sites), resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise created by bird scaring activity.	**Effect 4 (bird-scaring)**
	Disturbance / displacement of golden plover due to the Proposed Development forming a barrier to the movement of birds between foraging and roosting sites, resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	**Effect 5 (barrier)**
	Deposition of dust in areas neighbouring the construction site during the construction phase. Deposition of dust resulting in loss of or damage to terrestrial or freshwater environments from smothering or enrichment resulting in effects on flora vegetation, invertebrates, amphibians, bats, otters (as designated features of SACs) and birds (as designated features of SPAs).	**Effect 6 (dust)**

Designation	Impacts in submission information	Presented in screening matrices as
	Production of aural and visual stimuli due to noise and vibration and movement during ground activities during construction and operation, including construction works, cargo loading, plane maintenance, airfield management, but not including bird scaring devices.	**Effect 7 (con. dist.)**
	In-combination effects of other developments and plans.	**Effect 8 (in-comb.)**

Stage 1: Screening Matrices

The European Sites included within the (Stage 1) screening assessment are:

- Thanet Coast and Sandwich Bay SPA;
- Thanet Coast and Sandwich Bay Ramsar;
- Thanet Coast SAC;
- Sandwich Bay SAC;
- Outer Thames Estuary ~~Marine~~ SPA;
- Margate & Long Sands ~~SCI (Inshore Marine)~~SAC;
- Stodmarsh SPA;
- Stodmarsh SAC;
- Stodmarsh Ramsar; and
- Blean Complex SAC.

Evidence for likely significant effects on their qualifying features is detailed within the footnotes to the screening matrices below.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded at Stage 1

✕ = Likely significant effect **can** be excluded at Stage 1

C = construction

O = operation

D = decommissioning

Where effects are not applicable to a particular feature they are greyed out with n/a.

Stage 1, Matrix A: Thanet Coast and Sandwich Bay SPA

Name of European site: Thanet Coast and Sandwich Bay SPA

Distance to Order Limits: 0m

European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
A069 **Turnstone** (non-breeding)	✓b	✓b	✓b	n/a	✓b	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	✓b	✓b	✓b
A140 **Golden plover** (non-breeding)	✓b	✓b	✓b	n/a	✓b	n/a	Xa	Xa	Xa	n/a	✓b	n/a	n/a	✓b	n/a	Xa	n/a	Xa	✓b	n/a	✓b	✓b	✓b	✓b
A195 **Little tern** (breeding)	n/a	n/a	n/a	n/a	✓b	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Evidence supporting conclusions

a. Table 3.2 Screening Assessment
b. Section 4 Assessment of Adverse Effects

Stage 1, Matrix B: Thanet Coast and Sandwich Bay Ramsar

Name of European site: Thanet Coast and Sandwich Bay Ramsar Site

Distance to Order Limits: 0m

European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Turnstone (non-breeding)	✓b	✓b	✓b	n/a	✓b	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	✓b	✓b	✓b
Red Data Book invertebrates	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	✓b	✓b	✓b

Evidence supporting conclusions

a. Table 3.2 Screening Assessment
b. Section 4 Assessment of Adverse Effects

Stage 1, Matrix C: Thanet Coast SAC

Name of European site: Thanet Coast SAC																								
Distance to Order Limits: 300m																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
H1170 Reefs	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa
H8330 Submerged or partially submerged sea caves	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix D: Sandwich Bay SAC

Name of European site: Sandwich Bay SAC																								
Distance to Order Limits: 0m																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
H2110 Embryonic shifting dunes	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	Xa	n/a	Xa	n/a	n/a	n/a	✓b	✓b	✓b
H2120 Shifting dunes along the shoreline	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	Xa	n/a	Xa	n/a	n/a	n/a	✓b	✓b	✓b
H2130 Fixed coastal dunes with herbaceous vegetation	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	Xa	n/a	Xa	n/a	n/a	n/a	✓b	✓b	✓b
H2170 Dunes with Salix repens ssp. argentea	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	Xa	n/a	Xa	n/a	n/a	n/a	✓b	✓b	✓b
H2190 Humid dune slacks	Xa	Xa	Xa	n/a	n/a	n/a	✓b	✓b	✓b	n/a	n/a	n/a	n/a	n/a	n/a	Xa	n/a	Xa	n/a	n/a	n/a	✓b	✓b	✓b

Evidence supporting conclusions

a. Table 3.2 Screening Assessment
b. Section 4 Assessment of Adverse Effects

Stage 1, Matrix E: Outer Thames Estuary SPA

Name of European site: Outer Thames Estuary SPA

Distance to Order Limits: 3.4km

European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
A001 Red-throated diver (non-breeding)	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa
A195 Little tern (foraging areas during breeding season)	n/a	n/a	n/a	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa
A193 Common tern (foraging areas during breeding season)	n/a	n/a	n/a	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix F: Margate and Long Sands ~~SCI~~SAC

Name of European site: Margate and Long Sands ~~SCI~~SAC																								
Distance to Order Limits: 4.8km																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
H1110 Sandbanks slightly covered by seawater at all times	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix G: Stodmarsh SPA

Name of European site: Stodmarsh SPA																								
Distance to Order Limits: 8.4km																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
A021 Bittern (~~Breeding and~~ Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
A082 Hen harrier (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
A051 Gadwall (Breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
A051 Gadwall (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
A056 Shoveler (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Waterbird Assemblage (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Breeding Bird Assemblage	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix H: Stodmarsh SAC

Name of European site: Stodmarsh SAC																								
Distance to Order Limits: 7.7km																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
A1016 **Desmoulin`s whorl snail**	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix I: Stodmarsh Ramsar

Name of European site: Stodmarsh Ramsar Site

Distance to Order Limits: 8.4km

European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Six British Red Data Book wetland invertebrate species~~, two nationally rare and five nationally scarce plant species; and diverse assemblage of rare wetland birds~~~~Red Data Book wetland invertebrates~~	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa
Two nationally rare and five nationally scarce plant species	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa
Bittern (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Bittern (Breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Hen harrier (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Gadwall (Breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa

Gadwall (~~Non-breeding~~autumn/spring passage)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa
Shoveler (Non-breeding)	n/a	n/a	n/a	n/a	Xa	n/a	Xa	Xa	Xa	n/a	Xa	n/a	n/a	Xa	n/a	Xa	n/a	Xa	Xa	n/a	Xa	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

Stage 1, Matrix J: Blean Complex SAC

Name of European site: Blean Complex SAC																								
Distance to Order Limits: 11.5km																								
European site features	Likely effects of the Proposed Development																							
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird scaring)			Effect 5 (barrier)			Effect 6 (dust)			Effect 7 (con. dist.)			Effect 8 (in-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
H9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Xa	Xa	Xa

Evidence supporting conclusions

a. Table 3.2 Screening Assessment

B1

Appendix B
Designation Information

Table B.1 European Sites (and Qualifying Interest Features) within 15km of the Order Limits

Site name and designation	Site interest features	Distance and (direction) from Order Limits
Thanet Coast and Sandwich Bay Ramsar	The Ramsar site (covering 2,169ha) is designated for supporting internationally important numbers of non-breeding turnstone *Arenaria interpes* (under Ramsar Criterion 6), and 15 Red Data Book invertebrate species associated with wetlands (under Criterion 2).	Adjacent (0m) to Order Limits
Thanet Coast and Sandwich Bay SPA	The SPA (covering 1,838ha) is designated for populations of European importance of turnstone (non-breeding); golden plover *Pluvialis apricaria* (non-breeding) and little tern *Sternula albifrons* (breeding).	Adjacent (0m) to Order Limits
Sandwich Bay SAC	The SAC (covering 1,137ha) is designated for the following Annex I habitats that are a primary reason for selection of this site: • Embryonic shifting dunes; • Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"); • Fixed coastal dunes with herbaceous vegetation ("grey dunes") * Priority feature; and • Dunes with *Salix repens ssp. argentea* (*Salicion arenariae*). Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Humid dune slacks.	Within Order Limits
Thanet Coast SAC (including inshore marine)	The SAC (covering 2,816ha) is designated for the following Annex I habitats that are a primary reason for selection of this site: • Reefs; and • Submerged or partially submerged sea caves.	330m South-east
Outer Thames Estuary ~~Marine~~ SPA	This ~~marine~~ SPA (covering 379,824ha) is designated for supporting a population of European importance of the Annex 1 species: red-throated diver *Gavia stellata* (during winter) and the foraging areas for little tern and common tern *Sterna hirundo* during the breeding season.~~.~~	~3.4km North
Margate ~~&~~ and Long Sands S~~CI~~[56]AC ~~(Inshore Marine)~~	Margate and Long Sands SAC 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 Annex I Sandbanks slightly covered by seawater at all times, the largest of which is Long Sands itself.	~4.8km North
Stodmarsh SAC	The SAC (covering 563ha) is designated for the following Annex II species that is the primary reason for selection of this site: Desmoulin`s whorl snail (*Vertigo moulinsiana*).	~7.7km South-west
Stodmarsh Ramsar	The Ramsar site (covering 481ha) is designated under Ramsar Criterion 2 for supporting: • Six British Red Data Book wetland invertebrates; • Two nationally rare and five nationally scarce plant species; and • Its diverse assemblage of rare wetland birds which includes gadwall *Anas strepera* (during passage and the breeding season) and bittern *Botaurus stellaris*, shoveler *Anas clypeata* and hen harrier *Circus cyaneus* (in winter).	~8.4km South-west
Stodmarsh SPA	The SPA (covering 481ha) is designated for its populations of European importance of bittern, gadwall, shoveler and hen harrier (during winter) ~~and~~, gadwall during the breeding season, ~~and~~	~8.4km South-west

~~[56] Margate and Long Sands was formally submitted by the government to the European Commission as a candidate Special Area of Conservation on 20 August 2010. Margate and Long Sands cSAC was adopted by the European Commission as a Site of Community Importance (SCI) in 2011. The UK Government then has 6 years from adoption to designate it as a SAC.~~

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Site name and designation	Site interest features	Distance and (direction) from Order Limits
	assemblage of breeding birds and assemblage of non-breeding waterbirds.	

Site name and designation	Site interest features	Distance and (direction) from Order Limits
Blean Complex SAC	A complex of broad leaved deciduous woodland designated for the Annex I habitat "Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli"*.	~11.5km West

Appendix C
Scoping Opinion, Consultee Responses

Table C.1 Consultee Comments to Scoping Report and 2017 PEIR

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
PINS	The Secretary of State notes that it is indicated in Section 3.5 that the Applicant intends to prepare an Evidence Plan in relation to HRA. It is recommended that preparation of this plan begins, and that NE is contacted, at the earliest opportunity during pre-application. Information on Evidence Plans is provided in Section 4 of this Opinion.	Consultation with NE is ongoing and additional consultations have occurred following publication of the PEI. Consultations to date have included discussions regarding physical scope, methods of survey and assessment, principles of mitigation and potential effects from noise and air quality on surrounding European sites.
PINS	It is suggested in paragraph 6.6.7, and also reflected in paragraph 6.6.12, that direct effects are those that affect receptors on a development site while indirect effects are those that affect offsite receptors. The Secretary of State considers that this approach does not properly reflect how effects should be assessed, e.g. construction works on the boundary of a site or construction and operational traffic movements to and from the Order Limits could disturb flora and fauna beyond and at some distance from the boundary, depending on the nature of the activity and the sensitivity of the receptor; and aircraft movements beyond the boundary could increase collision risk with birds. Consideration should be given by the Applicant to how direct and indirect effects are defined and assessed in the EIA.	Agreed and those effects beyond the Order Limits boundary which would occur as a direct result of proposal activities are considered as direct effects.
PINS	It is noted that the list of potential receptors scoped in for further assessment in Table 6.2 does not include over-wintering birds, although Section 6.6 identifies potential for wintering birds to be found on the Order Limits and a potential need for more detailed survey work. The Secretary of State recommends that potential effects on these species are considered in the EIA.	Potential effects on over-wintering birds have been considered within ES Chapter 7 and the HRA report (Appendix 7.1).
PINS	Paragraph 6.6.16 notes that the design of the Proposed Development will incorporate measures to avoid or reduce adverse effects or deliver enhancements. Very limited reference is made in this chapter to potential mitigation measures for effects which may not be avoided or reduced as a result of the design, and no reference is made to how potential residual effects will be considered and assessed in the EIA. The Secretary of State expects such matters to be covered in the ES.	Explanation and details of mitigation measures for effects which may not be avoided or reduced as a result of the design have now been included within ES Chapter 7 and the HRA report (Appendix 7.1).
PINS	The Secretary of State draws attention to the need to consider combined effects in addition to cumulative effects. The ecological assessment should take account of noise, vibration, and air quality (including dust) impacts, and include consideration of the interrelationship between effects on ground and surface water and on biodiversity features. The Applicant's attention is drawn to the comments of TDC, contained in Appendix 3 of this Opinion, in this regard. The Secretary of State notes and welcomes that the outcomes of the air quality assessment will be evaluated in the ES biodiversity chapter. Cross-reference should be made in the ES between the relevant topic chapters.	Noise, vibration and air quality outcomes have been included in the assessment in the ES biodiversity chapter, with cross-reference made in the ES between relevant topic chapters.
PINS	The Applicant's attention is drawn to the comments of KCC, contained in Appendix 3 of this Opinion, particularly in relation to the extent of the ecological study areas, and potential effects on nearby internationally designated sites.	Noted

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
Kent County Council	KCC queries why there appears to be no intention to consider the potential effects of air quality and aircraft deposition on the SPA or Ramsar sites; the presence of the features is dependent on the quality of habitats and as such KCC considers there to be a need to consider habitat impacts.	The potential effects of changes to air quality and deposition as a result of the proposals have now been considered within ES Chapter 7 and the HRA report (Appendix 7.1).
Kent County Council	Depending on the expected levels of use of the Order Limits, KCC also queries whether there is a need to consider the impacts of traffic and freight travelling to and from the airport on designated sites further afield.	The potential effects of changes to air quality from aircraft and any additional traffic as a result of the proposals are have now been considered within ES Chapter 7 and the HRA report (Appendix 7.1).
Minster Parish Council	Topics to be covered assume a zone of influence of 5km or, in the case of the road network, the local impact. The potential for the impact of operational development to exceed this distance seems clear, particularly with regard to noise impact upon the resident population beneath and adjacent to flight paths and the impact upon the nearby SPA and Ramsar site in terms of ecology.	Potential noise impacts on the Thanet Coast and Sandwich Bay SPA are now considered within the ES Chapter 7 and the HRA report (Appendix 7.1).
Natural England	NE welcomes the recognition in this chapter [Air Quality] that there is the potential for air quality impacts on vegetation and ecosystems as well as human health. We are generally satisfied with the methodology proposed where it relates to the assessment of impacts on the natural environment and we would be happy to work with the applicant to identify and agree appropriate, sensitive non-human receptors as recommended in paragraph 3.46 of your Scoping Opinion. We are pleased to see that air quality impacts will be assessed not only from the aircraft themselves but also from the additional traffic that will be associated with the airport during both the construction and operational phases of the development. Paragraph 5.6.2 of the Scoping Report provides criteria from the Design Manual for Roads and Bridges (DMRB) guidance on when a formal air quality assessment of vehicular emissions is likely to be required. Such an assessment will need to be carried out for designated nature conservation sites sensitive to air quality impacts where they fall within 200m of a road meeting one or more of the criteria listed here.	Designated nature conservation sites sensitive to air quality effects that they fall within 200m of a road meeting one or more of the criteria listed in the chapter have been identified and air quality impacts subsequently assessed and included within the ES.
Natural England	As this is the chapter most closely aligned to NE's remit, it is worth making a more general point here about the early stage this project appears to be at, certainly in terms of the level of detail reflected in the Scoping Report, with most of the information in this chapter being extremely generic. We share your concerns around the 'limited detail and evidence' provided on key areas such as the gathering of baseline data, the approach to be taken to assessing environmental impacts and proposed mitigation measures (Scoping Opinion, paragraph 3.8). However, we can advise you that Amec Foster Wheeler have recently contacted us to seek more detailed advice on biodiversity issues and in particular in putting together an HRA Evidence Plan.	Noted

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
Natural England	We note from Section 6.5 of the Scoping Report that a 10km search radius has been used to identify statutory sites which may be affected by the Proposed Development and we support your request (Scoping Opinion, paragraph 3.59) that the Environmental Statement (ES) provide justification for a zone of influence of this size. We consider that the designated sites listed below are those which are most likely to be affected by the development, all of which fall within the current 10km zone, but we will work with the applicant as more detailed information becomes available to assess whether or not there are any other relevant sites outside this: • Sandwich Bay to Hacklinge Marshes Site of Special Scientific Interest (SSSI) (0.9 km); • Sandwich Bay Special Area of Conservation SAC (0.9 km); • Thanet Coast SAC (0.9 km); • Thanet Coast and Sandwich Bay SPA (0.9 km); • Thanet Coast and Sandwich Bay Ramsar site (0.9 km); • Sandwich & Pegwell Bay National Nature Reserve (NNR) (0.9 km); • Thanet Coast SSSI (4.3 km); • Outer Thames Estuary SPA (4.7 km); • Margate ~~&~~ and Long Sands SAC (6 km); • Stodmarsh SSSI / SAC / SPA / Ramsar site / NNR (7.6 km); and • Preston Marshes SSSI (8.9 km).	The designated sites listed have been considered in the assessment particularly with regard to changes in air quality/deposition and noise effects.
Natural England	We are generally happy with the broad summary of impacts scoped in for further assessment as outlined in paragraph 6.6.12 of the Scoping Report. We would add that when assessing the potential impact of management measures to reduce bird collision risk, the ES also covers any implications stemming from the resumption of the 13km bird strike safeguarding zone defined by the International Civil Aviation Organisation (ICAO) which would require all future planning applications within this zone to be assessed for their potential impacts on bird numbers and movements. When assessing all impacts on designated sites, a comparison should be made between what is proposed in the DCO and the previous airport operations.	Consideration has been given in the assessment to previous operations at Manston Airport in comparison with what is proposed in the DCO.
Natural England	We agree with your request that the potential for effects on relevant habitats and species resulting from pollution incidents during both the construction and operational phases of the airport should remain scoped in at this stage (Scoping Opinion, paragraph 3.34), particularly given the confirmed presence of contamination on-Site (Scoping Report, Chapter 9). We support Thanet District Council's request that a Construction Environmental Management Plan (CEMP) should form part of the ES.	Effects from pollution incidents during construction and operation of the airport have been considered, and a CEMP provided as part of the ES.
Natural England	We do not believe that Table 6.2 of the Scoping Report currently provides a comprehensive cross-reference of each designated site with the likely pathways of impact by which the Proposed Development could affect it. We would query why the potential for deterioration in water quality is not picked up for those sites with a hydrological link to the airport. We also support Kent County Council's query as to why it is not proposed to consider the potential effects of air quality and aircraft deposition on SPA and Ramsar sites.	More detail on likely pathways to designated sites has been provided. Potential effects of air quality changes/nutrient nitrogen deposition on any sensitive habitats within European sites has now been considered.

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
Natural England	NE notes [Ground and Surface Water] the main site discharge point from the runway and apron areas is via a pipe running out to the designated sites at Pegwell Bay and that if the applicant wishes this discharge to continue under their operation of the Order Limits then they will need to apply to the Environment Agency (EA) for a new discharge permit. In our initial meeting with the applicant on 26 April 2016 we advised that we would not wish to see any reduction in the quality of this discharge from what was previously permitted. We are pleased to see that the ES will give further consideration to the effects on water quality targets at Pegwell Bay and associated designated sites (Scoping Report, paragraph 7.6.4) and we also support your Scoping Opinion request (paragraph 3.35) that the potential for accidental spillages to Pegwell Bay via the Order Limits drainage network during construction remains scoped in at this early stage.	Noted. The potential effects to water quality targets at Pegwell Bay and associated designated nature conservation sites have now been considered.

Table C.2 Consultee Comments to 2018 PEIR

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
Natural England	**ES Chapter 6**. NE have checked the selection of the major ecological receptors and note that they all appear to fall at the nearest boundary point of the designated sites. We would query whether you have considered the possibility that there may be more sensitive habitats further within particular sites which may suffer a more significant impact even though emission or deposition levels are reduced by this point?	A tech. note explaining the rationale behind the location of the receptors has been provided to NE. The air quality assessment of European sites takes a precautionary approach, in that it is based on APIS data for the most sensitive habitats within the site, rather than on the less sensitive habitats close to the receptors. NE are in agreement with this approach.
Natural England	**ES Chapter 6**. NE would welcome the opportunity to discuss the derivation of the NOx target for protected conservation areas which this table gives as a daily mean of 200 µg m^{-3} as our internal guidance provides a 24-hr mean NOx level for all vegetation types of 75 µg m^{-3}.	An assessment level of 200 µgm^{-3} was agreed with NE during a meeting on 5 September 2017
Natural England	**ES Chapter 6**. NE notes that this table identifies a likely significant effect (PC >1% AND PEC >70%) on 6 major ecological receptors (E08, E09, E17, E24, E11, E22). Given that paragraph 6.8.26 states that results are only given for a ‘selection’ of receptors we would appreciate confirmation that all incidences of significant impact on major ecological receptors have been listed here. This concern should also be applied to all other relevant tables in this chapter.	Confirmed
Natural England	**ES Chapter 7, Section 7.1**. NE notes that road traffic generated through both the construction and operational phases of the development may also affect designated sites sensitive to changes in air quality and that modelling will inform the assessment of such effects and be reported within the ES. Natural England would welcome discussion with your consultants on this matter in advance of the publication of the ES as this is a key air quality issue.	The assessment of air quality effects of road traffic on and off-site on ecological receptors has now been included in the ES.
Natural England	**ES Chapter 7 (pages 6-8): Nitrogen deposition in Year 20**. NE note that where initial modelling indicates a likely significant effect at receptor E22 (Pegwell Bay), further work will be undertaken prior to publication of the ES to ascertain whether this would result in an adverse effect on site integrity.	The assessment for E22 has now been undertaken and included in the ES.

Consultee	Comments and considerations	How addressed in the ES, and this HRA report
Natural England	**ES Chapter 7, Section 7.10.27**. NE notes that the potential for combined air pollution impacts from both traffic and aircraft on designated sites has yet to be confirmed and that further air quality modelling data will feed into the ES. We would welcome further discussion with your ecological consultants on this as accurate assessment of any in-combination air quality impacts is a priority issue.	The assessment for the combined air pollution impacts from aircraft and road traffic have now been included in the ES.
Natural England	**ES Chapter 7, Appendix 7.1, Table 5.1: Operation (aircraft take-off and landing)**. NE does not agree with the conclusion that, at ground level, noise levels below 80 dB LAMax are unlikely to cause disturbance to birds and this is a key unresolved issue for us.	The assessment will now be based on 70dB LAmax for the more noise sensitive species (such as golden plover). This has been derived from an extensive review of literature, research and case studies, as presented in Chapter 7, Appendix 7.4.
Natural England	**ES Chapter 7, Appendix 7.1, Table 5.1: Operation (aircraft take-off and landing, and ground-based activities). Deposition of oxides of nitrogen from aircraft engines** – the only reference in the Geographic Extent column is to 'European sites within 200m of the construction site and/or wider road network – this surely cannot be a relevant geographic parameter for aircraft?	Table 5.1 has been amended to include reference to the likely zone of influence derived from the air quality modelling in Chapter 7.
Natural England	**Chapter 7, Appendix 7.1, Table 5.1: Management of bird strike risk**. NE note the use of a 1km buffer from the runway area and that this is based on trails at London Ashford Airport: we will confirm our view on this as soon as possible. In view of this, NE are not in a position to agree with conclusions of no likely significant effect through the pathways of noise and visual disturbance from aircraft and bird scaring	We are seeking to confirm the types of bird scaring methods to be used at Manston, and if they are similar and applicable to use in our assessment, to those used at London Ashford Airport.
Natural England	**Chapter 7, Appendix 7.1, Table 5.2. Turnstone & golden plover: Construction phase (outfall).** NE does not agree that a conclusion of no LSE can be reached for the Thanet & Sandwich Bay SPA/Ramsar in advance of a CEMP being produced and reviewed by relevant stakeholders including ourselves.	Noted
Natural England	**Chapter 7, Appendix 7.1, Table 5.2**: **Nationally rare wetland invertebrates – Operation phase (AQ)**. NE note that the potential for LSE is yet to be determined and will require further modelling and consultation with ourselves.	The assessment into the effects of air pollution on the habitats the Ramsar site invertebrate species depend has now been undertaken and included in the ES.
Natural England	Chapter 7, Appendix 7.1, Table 5.2. Annex 1 habitats and Sandwich Bay SAC – Operation phase (AQ) - we note that the potential for LSE is yet to be determined and will require further modelling and consultation with ourselves.	The assessment into the effects of air pollution on the qualifying Annex 1 habitats of the Sandwich Bay SAC has now been undertaken.
Natural England	**Chapter 7, Appendix 7.4**. NE has been working with your ecological consultant and providing informal review of this technical note as it has developed. We do not propose to provide detailed comments here, other than to state that while we are in agreement with the first two bullet points regarding altitude and lateral distance in the concluding section (2.2), NE do not accept 80 dB LAmax as a minimum threshold for noise disturbance and are still in discussion with your ecological consultants on this matter.	Noted

D1

Appendix D
Conservation Objectives

Thanet Coast and Sandwich Bay SPA (Site Code: UK9012071)

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Qualifying Features:

- A140 Golden plover: non-breeding;
- A169 Turnstone: non-breeding; and
- A195 Little tern: breeding.

Thanet Coast SAC (Site Code: UK0013107)

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely.

Qualifying Features:

- H1170~~.~~ Reefs; and
- H8330~~.~~ Submerged or partially submerged sea caves.

Sandwich Bay SAC (Site Code: UK0013077)

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely.

Qualifying Features:

- H2110~~.~~ Embryonic shifting dunes;

- H2120~~.~~ Shifting (white) dunes along the shoreline, with marram grass (*Ammophila arenaria*);
- H2130~~.~~ Fixed dunes with herbaceous vegetation ("grey dunes") - dune grassland;
- H2170~~.~~ Dunes with *Salix repens ssp. Argentea* - dunes with creeping willow; and
- H2190~~.~~ Humid dune slacks.

Outer Thames Estuary SPA ~~and proposed SPA~~ (Site Code: UK9020309)

With regard to the SPA ~~and pSPA~~ and the individual species and/or assemblage of species for which the site has been or may be classified (the 'Qualifying Features' including the 'Additional Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Qualifying Features:

- A001 Red-throated diver: Non-breeding.

Additional Qualifying Features*

- The foraging areas during the breeding season for A193 Common tern (*Sterna hirundo*): ~~Breeding~~; and
- A195 Little tern~~: Breeding~~.

*Government has initiated public consultation on the scientific case for the classification of these features as part of this Special Protection Area (SPA).

Margate and Long Sands ~~SCI~~ SAC (Site Code: UK0030371)

With regard to the ~~SCI~~ SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which the qualifying natural habitats rely.

Qualifying Features

- H1110~~.~~ Sandbanks which are slightly covered by sea water all the time.

Stodmarsh SPA (Site Code: UK9012121)

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Qualifying Features:

- A021 Bittern: Non-breeding;
- A051 Gadwall: Breeding;
- A051 Gadwall: Non-breeding;
- A056 Shoveler: Non-breeding;
- A082 Hen harrier: Non-breeding; and
- Waterbird assemblage: Non-breeding; and
- Breeding bird assemblage.

Stodmarsh SAC (Site Code: UK0030283)

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which the habitats of qualifying species rely;
- The populations of the qualifying species; and
- The distribution of the qualifying species within the site.

Qualifying Features:

- A1016 Desmoulin`s whorl snail (*Vertigo moulinsiana*).

Blean Complex SAC (Site Code: UK0013697)

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change.

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats;
- The structure and function (including typical species) of qualifying natural habitats; and
- The supporting processes on which qualifying natural habitats rely.

Qualifying Features:

- H9160~~.~~ Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*; Oak-hornbeam forests.

E1

Appendix E
Appropriate Assessment Matrices (Stage 2)

Potential Impacts

Potential impacts upon the European sites, which are considered within the Appropriate Assessment (Stage 2, see **Section 4**) part of this document, are provided in **Table F.1** below. Impacts have been grouped (and a keyword provided in parenthesis) where appropriate for ease of presentation.

Table E.1 Impacts considered within the Appropriate Assessment matrices

Designation	*Impacts in submission information*	*Presented in matrices as*
Thanet Coast and Sandwich Bay SPA **Thanet Coast and Sandwich Bay Ramsar** **Sandwich Bay SAC**	The introduction of toxic pollutants or sediments resulting in loss of, or damage to terrestrial or freshwater environments leading to direct or indirect effects on designated features due to run-off entering the European sites from the currently operational outfall, during construction and operation.	**Effect 1 (outfall)**
	Disturbance / displacement of birds (that are qualifying features of the SPAs/Ramsar sites, located within either the SPAs/Ramsars or on functionally linked habitat outside these sites), resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise and shadow created by planes on take-off and landing during operation.	**Effect 2 (aircraft)**
	Deposition of oxides of nitrogen from aircraft emissions (during operation) and road vehicles (during construction and operation) resulting in enrichment and/or acidification of the environment leading to alteration of the plant community through changes in baseline conditions resulting in direct or indirect effects on designated features.	**Effect 3 (Air quality)**
	Disturbance / displacement of birds (that are qualifying features of the SPAs/Ramsar sites, located within either the SPAs/Ramsars or on functionally linked habitat outside these sites), resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates due to noise created by bird scaring activity.	**Effect 4 (bird-scaring)**
	Disturbance / displacement of golden plover due to the Proposed Development forming a barrier to the movement of birds between foraging and roosting sites, resulting in a reduction of energy intake and/or an increase in energy expenditure leading to a reduction in survival or productivity rates.	**Effect 5 (barrier)**

	Production of aural and visual stimuli due to noise and vibration and movement during ground activities during construction and operation, including construction works, cargo loading, plane maintenance, airfield management, but not including bird scaring devices.	**Effect 6 (construction disturbance)**
	In-combination effects of other developments and plans	**Effect 7 (in-combination)**

Stage 2: Appropriate Assessment Matrices

The European Sites included within the (Stage 2) Appropriate Assessment are:

- Thanet Coast and Sandwich Bay SPA;
- Thanet Coast and Sandwich Bay Ramsar; and
- Sandwich Bay SAC.

Evidence for adverse effects on their qualifying features is detailed within the footnotes to the matrices below.

Matrix Key:

✓ = Adverse effect **cannot** be excluded at Stage 2

✕ = Adverse effect **can** be excluded at Stage 2

C = construction

O = operation

D = decommissioning

Where effects are not applicable to a particular feature (or have been screened out in Stage 1), the cells are 'greyed out'.

Stage 2, Matrix A: Thanet Coast and Sandwich Bay SPA

Name of European site: Thanet Coast and Sandwich Bay SPA

Distance to Order Limits: adjacent

European site features	Adverse effects of the Proposed Development																	
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 4 (bird-scaring)			Effect 5 (barrier)			Effect 6 (con. dist.)			Effect 7 (In-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
A169 **Turnstone** (non-breeding)	Xa	Xa	Xa		Xb											Xf	Xf	Xf
A140 **Golden plover** (non-breeding)	Xa	Xa	Xa		Xb			Xc			Xd		Xe		Xe	Xf	Xf	Xf
A195 **Little tern** (breeding)					Xb												Xf	

Evidence supporting conclusions

a. Following the incorporation of the environmental measures (see Paragraphs 4.2.4.44 to 4.2.4.47 inclusive, it is concluded that all effects on Pegwell Bay due to the outfall will be negligible.

b. The habitats utilised by golden plover, little tern and turnstone are located outside the area where adverse effects due to the visual presence and noise from over-flying aircraft would occur (see **Sections 4.2, 4.3 and 4.4** respectively).

c. Results from the desk study and surveys indicate a very low level of usage by golden plover of areas of land (i.e. within 1km of the Order Limits) where adverse effects due to bird scaring devices would occur (see **Section 4.2**).

d. Results from the desk study and surveys indicate that golden plover primarily roost on Pegwell Bay and forage in areas of farmland to the south-west, and thus are unlikely to fly over the Order Limits on a regular basis and therefore the Proposed Development would not act as a barrier to their movements (see **Section 4.2**).

e. Results from the desk study and surveys indicate a very low level of usage by golden plover of areas of land (i.e. within 750m of the Order Limits) where adverse effects due to construction-related disturbance would occur (see **Section 4.2**).

f. There are no known other developments and plans (as identified in **Table 18.2, Chapter 18: Cumulative Effects**) that would combine with the predicted adverse effects on the SPA features (and as discussed above and in **Sections 4.2-4.4**) from the Proposed Development in such a way as would result in adverse in-combination effects.

Stage 2, Matrix B: Thanet Coast and Sandwich Bay Ramsar

Name of European site: Thanet Coast and Sandwich Bay Ramsar Site															
Distance to Order Limits: 0m															
European site features	Adverse effects of the Proposed Development														
	Effect 1 (outfall)			Effect 2 (aircraft)			Effect 3 (AQ)			Effect 5 (barrier)			Effect 7 (In-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Turnstone (non-breeding)	Xa	Xa	Xa		Xb								Xd	Xd	Xd
Red Data Book Invertebrates							Xc	Xc	Xc				Xd	Xd	Xd

Evidence supporting conclusions

a. Following the incorporation of the environmental measures (see Paragraphs 4.2.4.44 to 4.2.4.47 inclusive, it is concluded that all effects on Pegwell Bay due to the outfall will be negligible.

b. The habitats utilised by turnstone are located outside the area where adverse effects due to the visual presence and noise from over-flying aircraft would occur (see **Section 4.4**).

c. Results from the air quality assessment (see **ES Chapter 6: Air Quality**, and **Section 4.6** of this report) conclude no adverse effects on the Ramsar site due to air pollution in the form of nitrogen levels in the air (NO_x) or nitrogen deposition. In view of this, the habitats the Red Data Book invertebrate species depend upon would not be adversely affected by air quality, and thus, there would be no adverse effects on this qualifying feature of the Ramsar site.

d. There are no known other developments and plans (as identified in **Table 18.2, Chapter 18: Cumulative Effects**) that would combine with the predicted adverse effects on the Ramsar site features (and as discussed above and in **Sections 4.4 and 4.6**) from the Proposed Development in such a way as would result in adverse in-combination effects.

Stage 2, Matrix C: Sandwich Bay SAC

Name of European site: Sandwich Bay SAC															
Distance to Order Limits: within															
European site features	Adverse effects of the Proposed Development														
	Effect 2 (aircraft)			Effect 3 (AQ)			Effect 4 (bird-scaring)			Effect 5 (barrier)			Effect 7 (In-comb.)		
	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
H2110 **Embryonic shifting dunes**				X a	X a	X a							X b	X b	X b
H2120 **Shifting dunes along the shoreline**				X a	X a	X a							X b	X b	X b
H2130 **Fixed coastal dunes with herbaceous vegetation**				X a	X a	X a							X b	X b	X b
H2170 **Dunes with *Salix repens* ssp. *argentea***				X a	X a	X a							X b	X b	X b
H2190 **Humid dune slacks**				X a	X a	X a							X b	X b	X b

Evidence supporting conclusions

a. Results from the air quality assessment (see **ES Chapter 6: Air Quality**, and **Section 4.5** of this report) conclude no adverse effects on the SAC due to air pollution in the form of nitrogen levels in the air (NO_x) or nitrogen deposition.

b. There are no known other developments and plans (as identified in **Table 18.2, Chapter 18: Cumulative Effects**) that would combine with the predicted adverse effects on the SAC features (and as discussed above and in **Section 4.5**) from the Proposed Development in such a way as would result in adverse in-combination effects.

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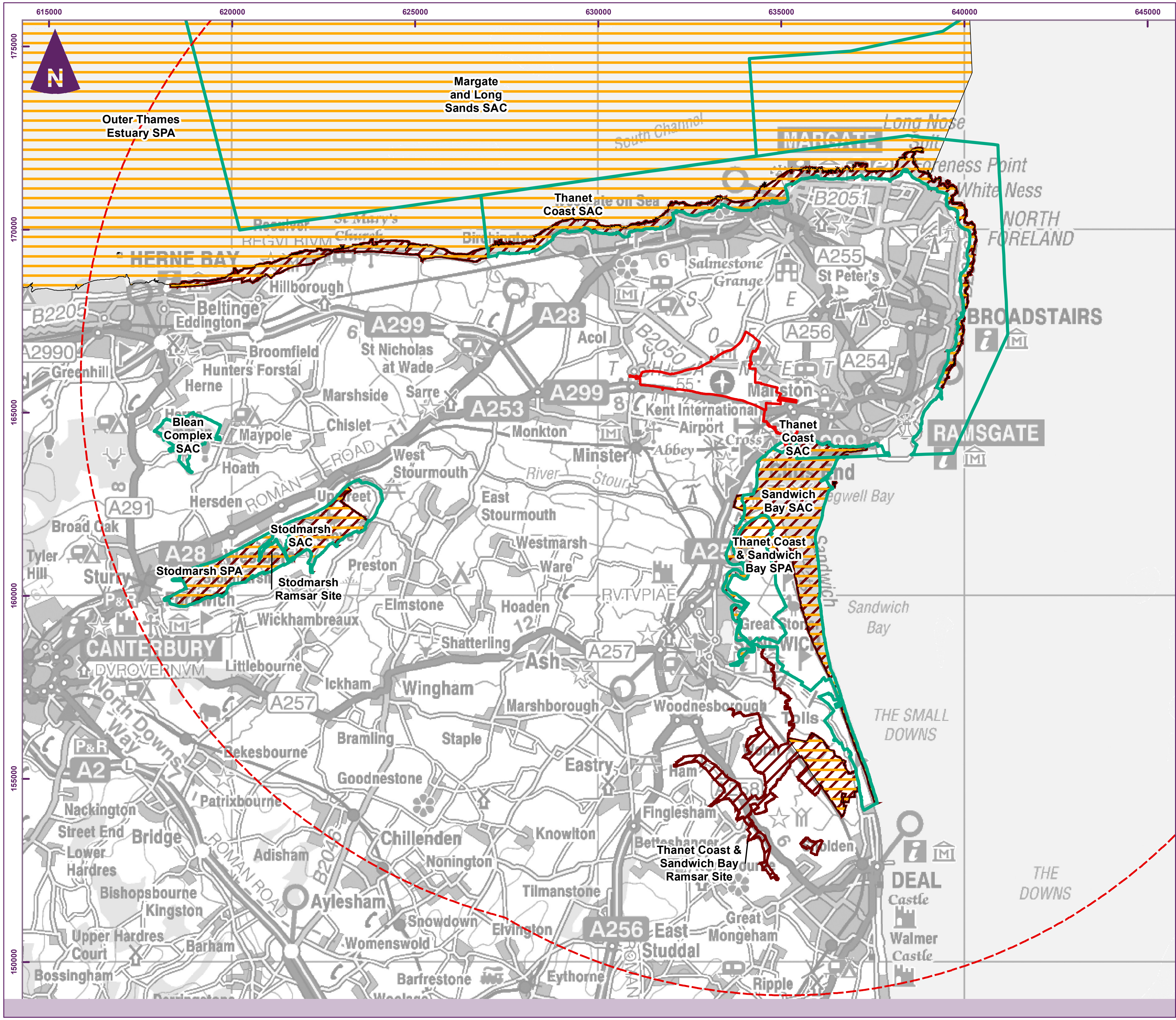
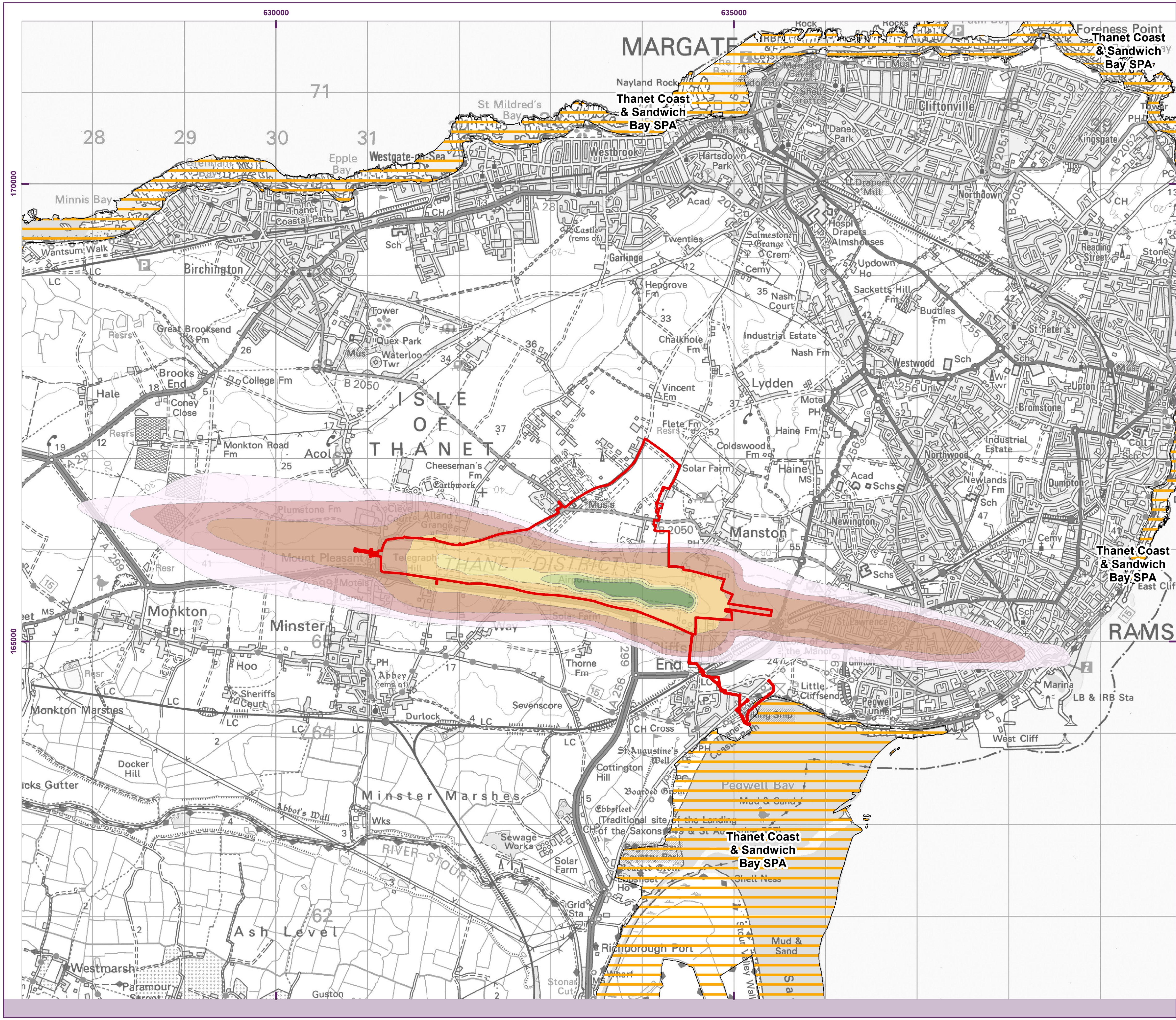


Figure 3.1
Statutory designated sites within 15km of the Order Limits

March 2018



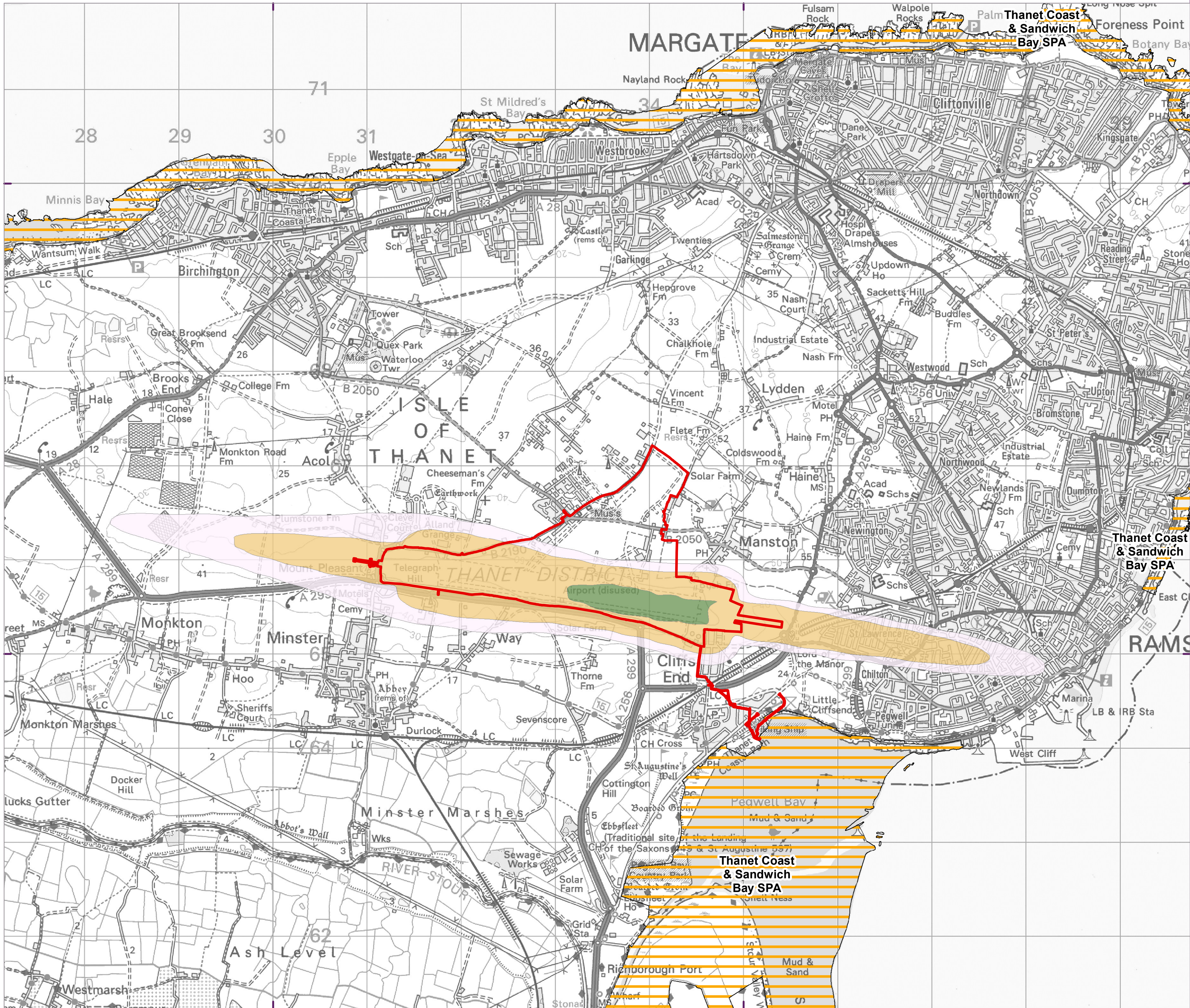
Average number of events per day

Figure 4.1a
Daytime noise levels at or above 80dB LAmax

RSP

amec foster wheeler

March 2018



Average number of events per day

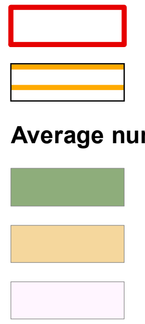
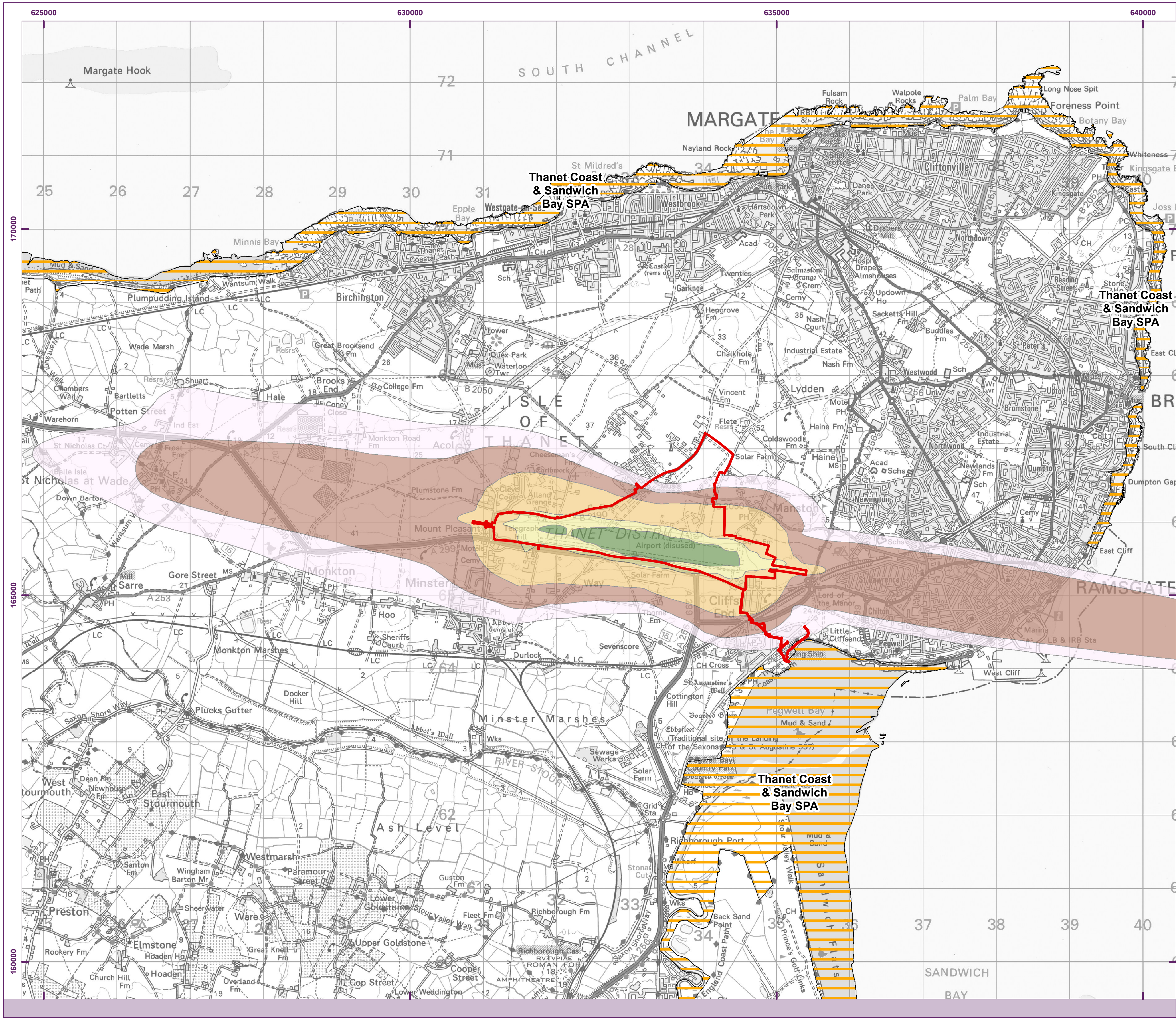


Figure 4.1b
Night-time noise levels at or above 80dB LAmax

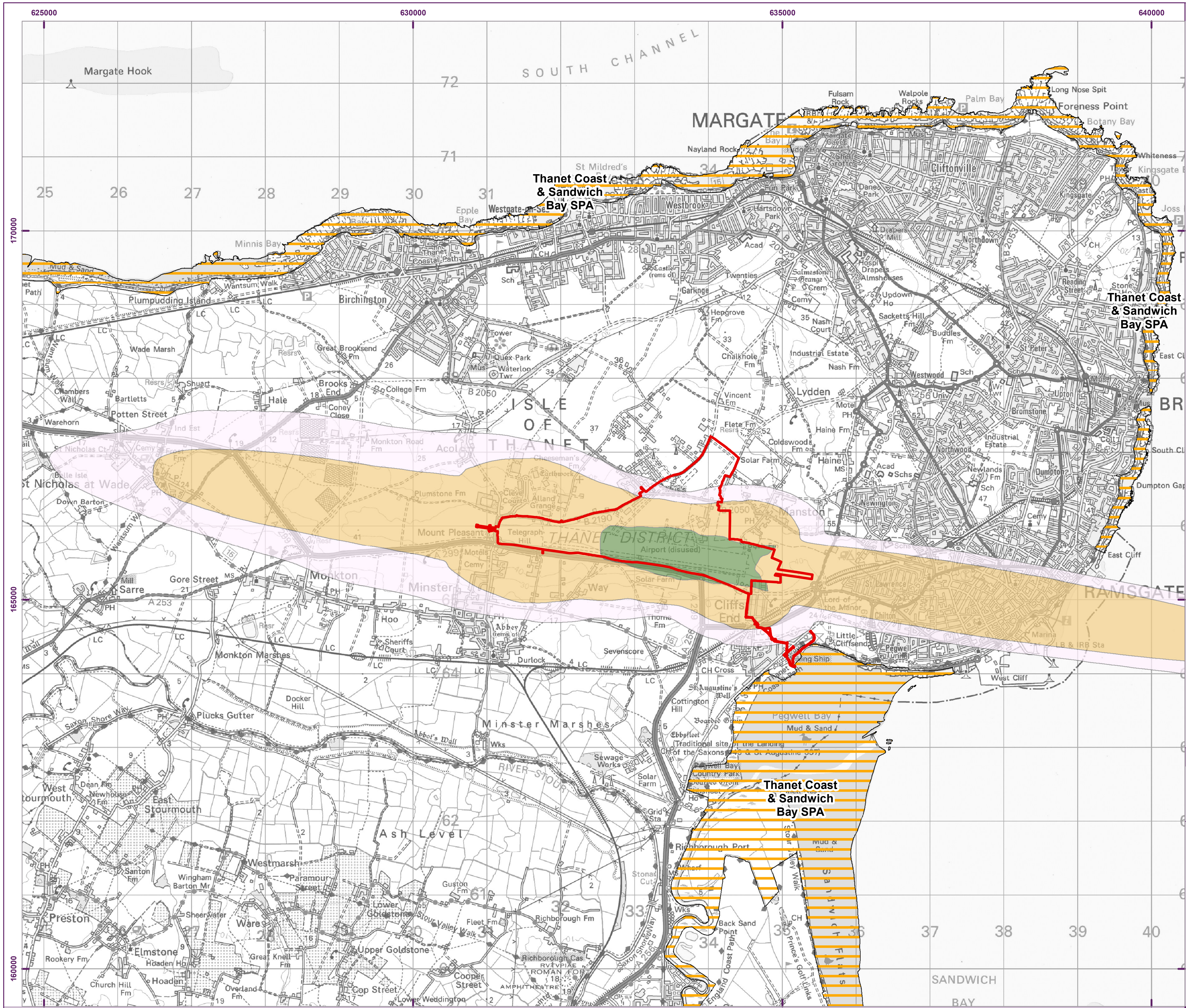
March 2018



Average number of events per day

Figure 4.2a
Daytime noise levels at or above 70dB LAmax

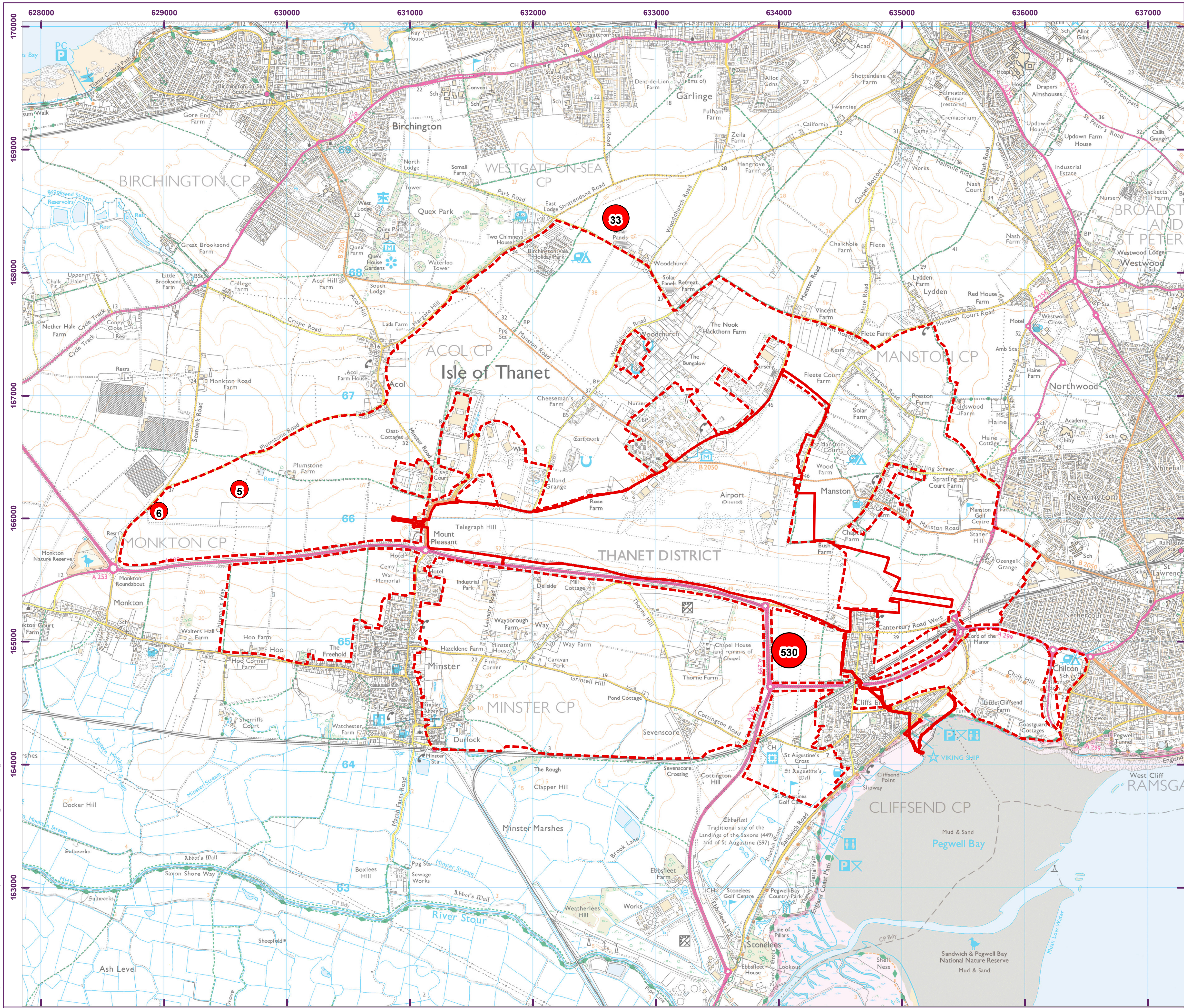
March 2018



Average number of events per night

Figure 4.2b
Nght-time noise levels at or above 70dB LAmax

March 2018



Key

Order Limits

Functional habitat survey area

Golden Plover Peak Count

1 - 20 birds

21 - 99 birds

100+ birds

0 0.5 1 1.5 km

Scale at A3: 1:30,000

Client

RSP

Manston Airport DCO Environmental Statement Report to Inform the Appropriate Assessment

amec foster wheeler

Figure 4.3
Functional Habitat Survey 2016/17: peak counts of Golden Plover

March 2018 38199-Lon417.mxd parkj

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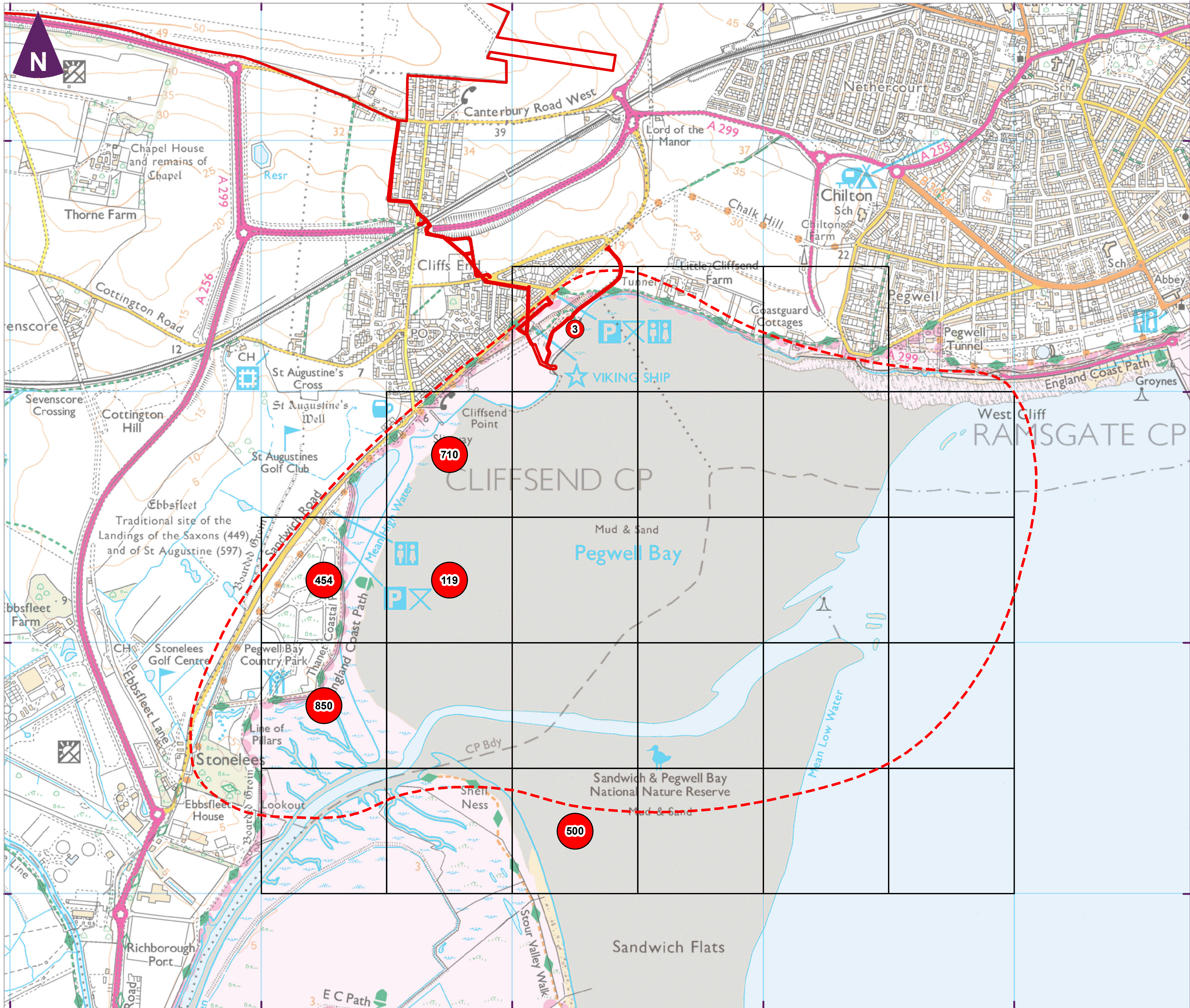

Key

	Order Limits
	Survey area
	500 x 500 m recording grid

Golden Plover Peak Count

- 1-20 individuals
- 21-99 individuals
- 100+ individuals

0 250 500 750 m

Scale at A3: 1:15,000

Client

RSP

Manston Airport DCO Environmental Statement Report to Inform the Appropriate Assessment

amec foster wheeler

Figure 4.4
Pegwell Bay Distribution Survey 2016/17: peak counts of Golden Plover in each 500m grid square

March 2018 38199-Lon418.mxd parkj

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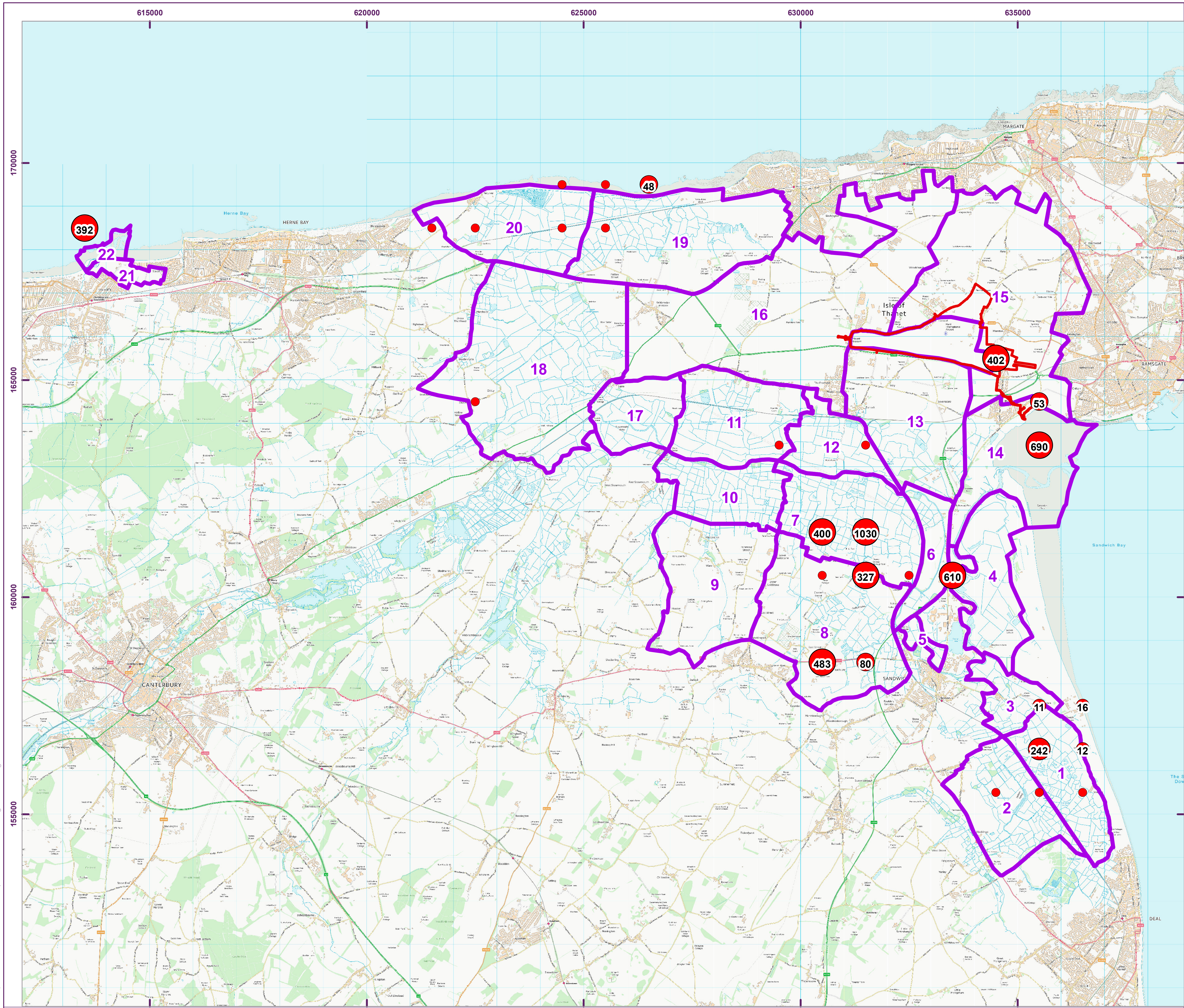

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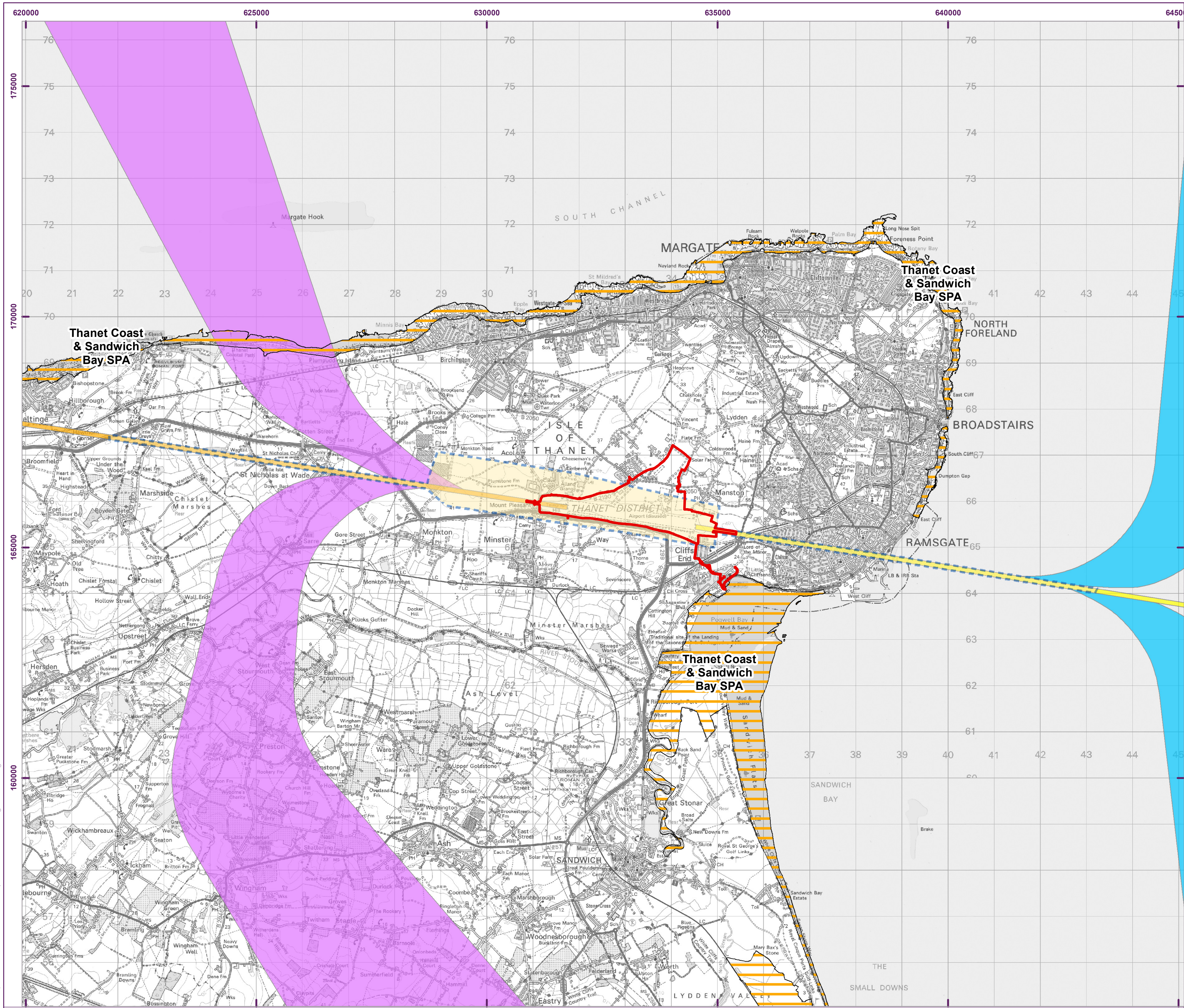
Figure 4.5
Henderson & Sutherland (2017): peak counts of golden plover

March 2018 38199-Lon419.mxd parkj



Contains Ordnance Survey data © Crown copyright and database right 2017

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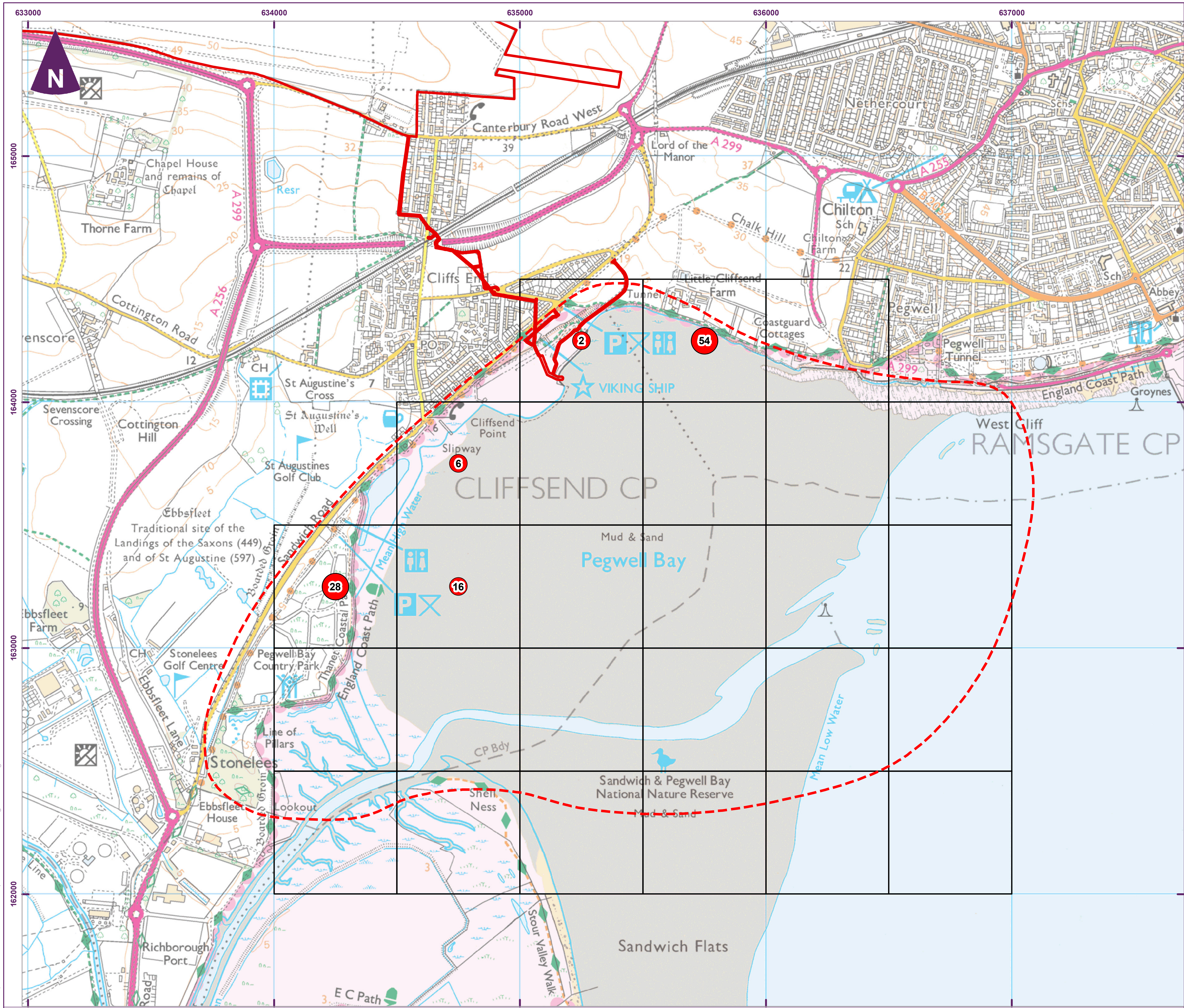
Figure 4.6
Proposed flight lines of aircraft under 500m in altitude

March 2018 38199-Lon420.mxd parkj



Key

- Order Limits
- Survey area
- 500 x 500 m recording grid

Turnstone Peak Count

- 1 - 20 individuals
- 21 - 99 individuals
- 100+ individuals

0 250 500 750 m

Scale at A3: 1:15,000

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Figure 4.7
Pegwell Bay Distribution Survey 2016/17: peak counts of Turnstone in each 500m grid square

March 2018 38199-Lon421.mxd parkj

file: H:\Projects\38199 LON Manston Airport DCO EIA\Drawings\ArcGIS\Figures\38199-Lon421.mxd

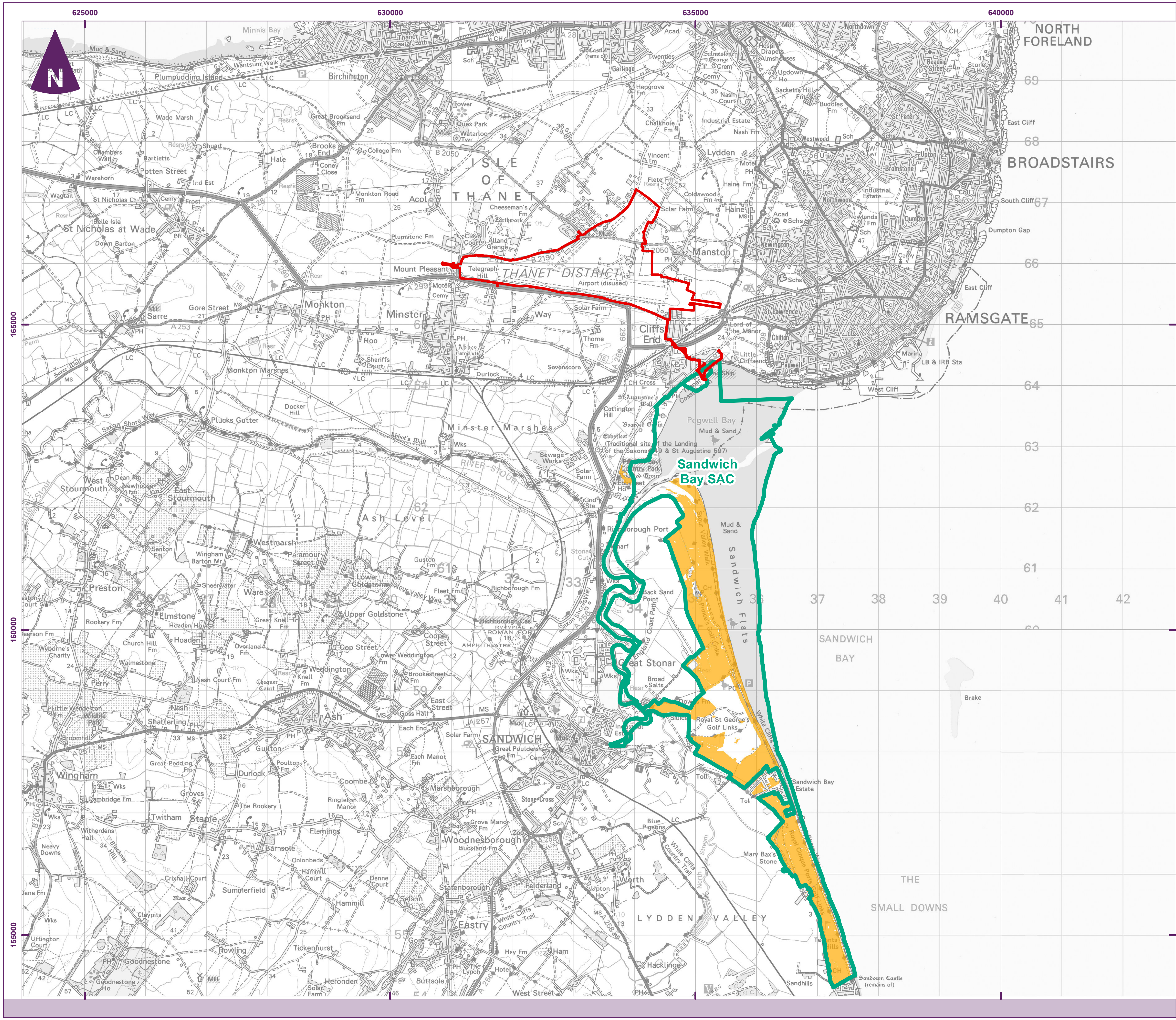

Figure 4.8
Sandwich Bay SAC - extent of Priority Habitat, Coastal Sand Dunes

March 2018

RiverOak Strategic Partners

Manston Airport DCO EIA

Ecological Desk Study

March 2018

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

RiverOak Strategic Partners

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Document revisions

No.	Details	Date
1	Draft version 2	12/05/2017
2	Draft version 3	23/11/2017
3	Final	26/03/2018

Contents

1. Introduction

1.1 Background

1.1.1 RiverOak Investment Corp LLC (RiverOak) is planning to reopen Manston Airport (hereon within this report referred to as the Site/ Order limits, which cover the same area of land) as a new air freight and cargo hub for the South East. This Site, covering approximately 303.2 hectares (ha), 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 Site also includes the route of the outfall which goes from the Operational Airport into Pegwell Bay.

1.1.2 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.

1.1.3 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.

2. Defining Protected and Notable Species and Habitats

2.1.1 A number of sites, habitats and species are protected or controlled through either statute, or national or local policy. **Boxes 1 and 2** define and provide details of those that are considered within this report. The scientific names of all species cited in this report are provided in **Appendix A**. Further details of legislation and policy related to biodiversity are provided in **Appendix B**.

Box 1 Designated Wildlife Sites, and Priority Habitats and Speciess,

Statutory nature conservation sites

Internationally important sites (collectively referred to in this report as European sites – whilst recognising that Ramsar sites are designated at a global level):

- Special Area of Conservation (SACs)[1];
- candidate SACs[2];
- Sites of Community Importance (SCIs)[3];
- Special Protection Areas (SPAs)[4];
- Listed or proposed Ramsar sites, potential SPAs, possible/proposed SACs[5]; and
- Sites identified or required as compensatory measures for adverse effects on other European sites[6].

Nationally important sites:

- Sites of Special Scientific Interest (SSSIs)[7]; and
- National Nature Reserves (NNRs).

Locally important sites:

- Nature Reserves (LNRs)

Statutory sites that are of importance for recreation and education as well as biodiversity. Their level of importance is defined by their other statutory or any non-statutory designations (e.g. if an LNR is also an SSSI but is not a European 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 borough/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).

[1] SACs are designated under Article 4(4) of Directive 92/43/EEC.
[2] Candidate SACs are designated under Article 4.1 of Directive 92/43/EEC.
[3] SCIs are sites that have been nominated or submitted by Member States and entered onto the list of sites compiled by the European Commission that form (along with SACs and SPAs) the Natura 2000 network. SCIs are subject to the provisions of Article 6(2) of Directive 92/43/EEC. SCIs are afforded full protection by law under the Conservation of Habitats and Species Regulations 2017 (regulation 8(1)(b)).
[4] SPAs are classified pursuant to the requirements of Directive2009/147/EC (Article 4). As European Sites they are provided with full protection by law under the Conservation of Habitats and Species Regulations 2010.
[5] Government policy in England (see paragraph 118 of the NPPF) protects Ramsar sites, potential SPAs and possible SACs as if they were fully classified SPAs or a fully designated SACs.
[6] Government policy in England (see paragraph 118 of the NPPF) is that any such compensatory land or water must itself be protected as if it were a fully classified SPA or a fully designated SAC.
[7] Some SSSIs also wholly or partially fall within a European Site boundary.

Box 1 (continued) Designated Wildlife Sites, and Priority Habitats and Speciess,

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[8] (Eaton *et al*., 2015);
- 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

Borough/district importance: Species and habitats listed in the Kent local Biodiversity Action Plan (LBAP)[9].

[8] 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.
[9] Kent BAP (2016) [Online] Available from: http://www.kentbap.org.uk/

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 2017* (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.

2.2 Purpose of Report

2.2.1 This report details the methods adopted and results of an ecological desktop study for the Site. These results will be used, along with the results from other ecological studies, to inform an Environmental Impact Assessment (EIA) to support a Development Consent Order (DCO) application for the Site.

3. Methods

3.1 Desk Study

3.1.1 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)[10] website, open access aerial mapping resources[11] and aerial photographs of the Site and surrounding area and from Ordnance Survey maps[12]. Data were gathered for:

- Statutory designated sites (national and international) on or within a 15 kilometre (km) radius of the Site;
- Non-statutory designated sites of nature conservation interest located on, or within 2km of the Site;
- Ancient woodland and other Habitats of Principal Importance (HPI) on, or within 2km 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 5km of the Site, including records of bats and bat roosts from the Kent Bat Group;
- Granted European Protected Species Mitigation Licences (EPSML) within 5km of the Site;
- Water bodies (potential great crested newt breeding habitat) within 500 metres (m)[13] of the Site, not separated from the Site by barriers (e.g. major roads, rivers, etc.) to great crested newt movement.

3.1.2 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.

3.1.3 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) and Henderson & Sutherland (2017);
- 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;
- 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);
- Kent Bird Reports 2013 and 2014: annual reports published by the Kent Ornithological Society, containing notable bird records in Kent (Privett [ed] 2015, 2016);

[10] http://magic.defra.gov.uk/MagicMap.aspx
[11] http://maps.google.co.uk
[12] https://www.ordnancesurvey.co.uk/osmaps
[13] 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. Note: English Nature is now Natural England.

- Kent Breeding Bird Atlas 2008-13 (Clements *et al*., 2015). Results from a county-wide survey, mapping the distribution of all breeding bird species at a tetrad (2x2km) resolution;
- 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);
- Civil Aviation Authority (CAA): birdstrike data from the former Kent International Airport; and
- Data derived from Environmental Statements for other proposed and consented developments for which information is publicly available, including:
  - Stone Hill Park (OL/TH/0550), a proposed residential development that shares a common boundary with the Site over much of its area;
  - Land East of Haine Road (OL/TH/14/0050), adjacent to the east of the Site;
  - Land south of Great West Autos (F/TH/12/0722), a now built solar farm, adjacent to the north of the Site;
  - Land east of Worlds Wonder (F/TH/14/0645), a proposed solar farm adjacent to the north of the Site; and
  - Land North of Thorne Farm (F/TH/13/0596): a now built solar farm adjacent to the south of the Site.

4. Results

4.1 Statistory Nature Conservation Sites

4.1.1 There are 17 statutory designated nature conservation sites within 10km of the Site. Summary descriptions of these, with the approximate distances from the Site/ Order Limits (in ascending order) are provided in **Table 4.1**, followed by (if different), the distances from the Operational part of the Airport (in parenthesis), and their locations in relation to the Site are shown on **Figure 4.1a**.

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

Site name and designation	Site interest features	Distance (metres) and direction from Order Limits (operational airport)
International		
Thanet Coast and Sandwich Bay – Ramsar	The Ramsar site (covering 2,169ha) 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.	0m (925m) South-east
Thanet Coast and Sandwich Bay – SPA	The SPA (covering 1,838ha) is designated for populations of European importance of turnstone (non-breeding); golden plover (non-breeding) and little tern (breeding)	0m (925m) South-east
Sandwich Bay – SAC	The SAC (covering 1,137ha) 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*.	0m (925m) South-east
Thanet Coast –SAC (including inshore marine)	The Marine SAC (covering 2,816ha) 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.	150m (925m) North-east
Outer Thames Estuary – Marine SPA	This marine Sea inlet (covering 379,824ha) regularly supports internationally important numbers of the Annex I Species (red-throated diver) in winter.	3,400 m North & North-west
Margate and Long Sands – 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.	4,840 m North
Stodmarsh - SPA	The SPA (covering 481ha) is designated for its populations of European importance of bittern, gadwall, shoveler and hen harrier (during winter), and gadwall during the breeding season.	7,700m South-west
Stodmarsh – SAC	The SAC (covering 563ha) is designated for a sizeable population of the rare Desmoulin’s whorl snail that lives beside ditches within pastures on the floodplain of the River Stour where reed sweet-grass, large sedges and common reed dominate the vegetation.	7,700m South-west
Stodmarsh – Ramsar	The Ramsar site (covering 481ha) is designated under Ramsar Criterion 2 for supporting: six British Red Data Book wetland invertebrates; 2 nationally rare and 5 nationally scarce plant species; and its diverse assemblage of rare wetland birds which includes	8,450m South-west

	gadwall during passage and the breeding season, and bittern, shoveler and hen harrier in winter. Otter is also recorded here.	
National		
Sandwich and Pegwell Bay – NNR	The NNR (covering 629ha) 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.	0m (925m) South-west
Sandwich Bay to Hacklinge Marshes – SSSI	The SSSI (covering 1,790ha) 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.	0m (925m) South-east
Thanet Coast - SSSI	The SSSI (covering 817ha) 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.	4,300m East
Stodmarsh – NNR	The NNR (covering 249ha) supports internationally important habitats including reedbeds, fens, ditches, wet grassland and open water which provide an ideal habitat for breeding and wintering birds, invertebrates and rare plants. Water voles are found on the reserve.	7,700m South-west
Stodmarsh – SSSI	The SSSI (covering 623ha) is notified for its wetland habitats and the plant and invertebrate communities they support. The SSSI is also notified for its breeding bird assemblage associated with open waters and their margins, and specifically for nationally important breeding populations of bearded tit, Cetti's warbler, gadwall, pochard and shoveler.	7,700m South-west
Preston Marshes - SSSI	The SSSI (covering 43ha) is the last remaining area of fen vegetation within the Little Stour Valley, and is notified for its reedswamp habitat and the present of the plant, sharp-leaved pondweed.	8,900m South-west
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.	2,500m South-east
Bishopstone Cliffs LNR	A clifftop grassland important for insects, with some rare varieties, and birds, such as sand martin (nesting in the cliffs), skylark, meadow pipit and corn bunting. The LNR is part of Reculver Country Park.	9,220m North-west

4.2 Non-Statutory Nature Conservation Sites

4.2.1 There are three non-statutory sites of nature conservation value within 2km of the Site boundary (see **Figure 4.1b**):

- Pegwell Bay Infilled Dry Valley Local Wildlife Site (LWS, ref. TH02), located 1km south-east of the Operational Airport, though is adjacent to the outfall (part of the Order Limits):

- Roadside Nature Reserve (RNR, ref. TH04), 1.5km north of the Site; and
- Woods and Grassland, Minster Marshes LWS (ref. TH12). The LWS is located approximately 1.6km to the south of the Site.

4.3 Habitats of Principal Importance (HPI)

4.3.1 No HPI was identified within the Site during the desk study, however, there are multiple parcels of HPI within the 5km search radius of the Site. All of the wetland and coastal habitats (apart from the maritime cliffs) are located to the south of the Site, much of which within the Thanet Coast and Sandwich Bay SPA, Ramsar site and SACs. These include the following habitat types (**Figure 4.2** shows the location of these habitats in relation to the Site:

- Traditional Orchards: there are several separate orchards within the 5km search area, the closest of which is at Thorne Farm (560m south of the Site); and the largest at Manston (750m north-east, covering 0.8ha);
- Deciduous woodland (Lowland Mixed Deciduous Woodland and Wood-pasture and Parkland): relatively small blocks of woodland are scattered throughout the search area, including eight blocks within 1km of the Site boundary, and the largest single block covering approximately 20-30ha that forms part of the Quex Park, 1.7km north of the Site;
- Lowland Fens: four small areas of this habitat (covering between 1-4ha each) are located within 2km of the Site, within Sandwich Bay SAC, the closest of which is 1.0km south of the Operational Airport (adjacent to the outfall). In addition, there is a much larger (70ha) area of fenland south of the River Stour (within the SPA/Ramsar but out with the SAC, and 2.9km south of the Operational Airport);
- Reedbeds: a single 0.9 ha block of reedbed, is located within Sandwich Bay SAC, 1.2km south of the Operational Airport (300m from the outfall), with a larger area (covering approximately 6ha) adjacent to the River Stour, 3.1km south of the Operational Airport (out with the SAC);
- Intertidal Mudflats: a large area of mudflats (covering approximately 260ha within the search area) are exposed at low tide, south of the River Stour in Sandwich Bay, the closest of which is 1.4km south of the outfall and 2.3km south of the Operational Airport. The area of mixed sand and mud (covering 250ha at low tide), north of the River Stour that forms Pegwell Bay (which is adjacent to the outfall, and 1km south-east of the Operational Airport) had not been classified as a priority habitat at the time of writing this report. All of these areas are within the SAC/SPA/Ramsar sites;
- Coastal Saltmarsh: a continuous fringe of saltmarsh (at its closest point 1km south of the Operational Airport, and adjacent to the outfall) stretches around the western and south western fringes of Pegwell Bay, and extends south-west along the banks of the River Stour. All of this saltmarsh (covering approximately 100ha) is within the SAC/SPA/Ramsar sites;
- Maritime Cliffs & Slopes: a broken chain of this habitat runs for 3km within the search area along the northern fringe of Pegwell Bay and north around the coast of Thanet, at its closest 800m south-east of the Operational Airport and adjacent to the outfall , and part of the SAC/SPA/Ramsar sites. Another broken stretch of this habitat (running for 10km within the search area), extends along the north Thanet coast from Minnis Bay to Thanet (4-5km north of the Site);
- Coastal Sand Dunes: an extensive area of coastal sand dunes (of which 140ha are within the search area) stretches from the southern end of Pegwell Bay (at its closest point, 1.7km south of the outfall, but 2.6km south of the Operational Airport), south along the coast adjacent to Sandwich Bay. All of this habitat is within the SAC, with the northern half also within the SPA/Ramsar.

- Coastal Vegetated Shingle: a narrow band of this habitat (approximately 2.8km south of the outfall) forms a boundary between the Sand Dune and Mudflat habitats, stretching south for more than 1.5km within the search area (all within the SAC/SPA/Ramsar);
- Coastal and Floodplain Grazing Marsh: there are several extensive blocks of this habitat that form a loose chain of grazing marsh stretching across the Minster Marshes and Ash Levels (none of which is within the SAC/SPA/Ramsar sites), the closest of which is 1.2km south of the Site, and in total covering approximately 140ha;
- Good Quality Semi-improved Grassland: there are two blocks of this habitat within the search area (but not within the SAC/SPA/Ramsar sites): one near the Ebbsfleet Sewage Treatment Works (2.6km south of the Operational Airport and 2.2 km south-west of the outfall, covering approximately 20ha), and the other at Richborough Farm (4.7km south of the Site/ Order Limits, covering 3ha); and
- Hedgerows and fresh standing water also occur within 5km of the Site.

4.4 Waterbodies

4.4.1 Six water bodies were identified within 500m of the Operational Airport (see **Figure 4.3**), of which one was located within the Site itself; and another lies adjacent to the Site, at its northern tip. The water bodies outside the Site are all separated from the Site by main roads/ dual carriageways, with two south of the A299, one north-west of the B2190 and one north-east of the B2050 (the Manston Road).

4.5 Protected or Otherwise Notable Species

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

Birds

4.5.2 KMBRC provided a summary table of the bird records they hold within 5km of the Site. **Table C1 in Appendix C** shows a summary of the records of protected or otherwise notable bird species provided (as defined in **Box 1**). 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**) is discussed, as follows:

Golden Plover

4.5.3 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 (Stroud *et al*., 2016), golden plover was removed as a designated species from the SPA (likely due to declining numbers), although this change is to date unratified. The UK population was estimated to be 420,000 birds in winter (Musgrove *et al*., 2013).

4.5.4 There is the potential for golden plover to use the farmland adjacent to the Site for foraging and roosting. These birds would be considered part of the SPA population. No golden plover were recorded within the Site during bird surveys undertaken for the proposed Stone Hill Park development in winter 2015/16 (WSP, 2016)[14]. Henderson & Sutherland (2017)[15] and Griffiths (2004) and data provided by the SBBO and KOS show that golden plover occur on both intertidal and inland areas around Pegwell Bay in winter. A range of roost sites were used, including Pegwell Bay, but also inland on farmland. Henderson & Sutherland (2017) divided their survey area into a number of Recording Areas (see **Figure 4.4**). The only records of golden plover within 2km of the Site were those in their Recording Area 15 to the east of the Site. The Recording Areas most frequently used by the highest numbers of roosting and foraging golden plover were to the south of the Site, the closest of which is approximately 3.5km from the Site on arable farmland in the Ash Levels (Area 7). **Figure 4.4** shows the peak count of golden plover in each 1 km grid square, as recorded during the 2016/17 surveys by Henderson & Sutherland (2017)[16]. **Table 4.2** provides further details on usage by golden plover of the 22 Recording Areas employed by Henderson & Sutherland (2017).

Table 4.2 Golden plover: level and type of use in each recording Area (Henderson & Sutherland, 2017)

Area No.	Area (distance and direction from Site)	% of [17]birds	Peak count	Description of use of the Recording Area
1	Worth Marshes east (7.5km south)	6	242	Regular; with a peak count of 242 birds in January, usually foraging in sheep grazed pastures
2	Worth Marshes west (8.0km south)		87	Recorded on three occasions and always in flight, with a maximum of 87 birds in February. However, thought likely sometimes to feed in this area.
3	St George's (6.3km south)		11	One record of 11 birds roosting in pasture in November
4	Sandwich Marshes (2.6km south)	18	610	Up to 610 roosting at the flood-relief pools adjoining the R Stour in November-December, but subsequently few present, and none noted on the farmland. Interchange with the low-tide roost in Pegwell Bay occurs.
5	Monks' Wall (5.8km south)		0	None recorded
6	Richborough Marshes (3km south)		6	One record of six birds roosting on wet, ploughed land in December
7	Ash Levels (east) (2.6km south)	28	1,030	The most strongly favoured area, holding 28% of all birds counted throughout the winter, and a maximum of 1,030 present in late January. While small numbers were noted feeding, most records were of roosting birds. A few were seen in sheep pasture but most occurred on winter cereal fields.
8	Goshall Valley (4.5km south)	11	810	Recorded on three visits (all foraging and roosting in winter cereal), with a peak count of 810 in early January. Interchange with Areas 4 and 7 was evident, and probably also Area 14, as 80 birds were seen flying north east towards Pegwell Bay on a falling tide on 11 February.
9	Nash-Westmarsh (4.5km south-west)		0	None recorded. A substantial part of the area near Nash favoured in previous years now has been planted with fruit trees, making it unsuitable for Golden Plovers.
10	Ash Levels (west) (3.2km south-west)		0	None recorded, despite the area being broadly similar in land use/habitat to Area 7

[14] Once monthly walkover surveys were undertaken within the Site from November 2015 to February 2016 inclusive.
[15] Surveys for golden plover and lapwing were undertaken across the wide area from the north coast of Thanet to Sandwich Bay, twice-monthly from November 2016 to March 2017 inclusive. The work was broadly a repeat of the surveys carried out in winter 2002/03 (Griffiths, 2004).
[16] The location of the birds has been placed in the centre of the 1 km grid square; though the count could have occurred anywhere within the square.
[17] The percentage of the total number of golden plover recorded during the Henderson & Sutherland (2017) survey, is provided for the main Areas used by the species.

Area No.	Area (distance and direction from Site)	% of [17]birds	Peak count	Description of use of the Recording Area
11	Monkton Marshes (1.5km south-west)		0	None recorded
12	Minster Marshes (1.6km south-west)		4	One record, involving four birds in late December
14	Pegwell Bay (0.5 km south-east)	15	690	The mudflats form a roost site, used intermittently at low tide. During survey visits, a peak count of 690 birds was recorded (in late November) though none was present on several survey dates. Regular visits to the area outside the survey (in winter 2016/17) produced peak counts of 880 in November, 150 in December, 800 in January, 1000 in February but none in March. Disturbance caused by bait-diggers and other sources continues to be a problem in this area.
15	Upland Thanet (east) (adjacent to the east)		402	Some areas, especially to the east, were unsuitable because of the tall Brassica crops. Areas of ploughed/fallow land closer to Pegwell Bay were used for feeding and roosting in the first half of the winter, as follows. A flock of 402 birds was roosting and foraging in a field adjacent to the south-east of the Site on 13 November; followed by 53 roosting in a different field (1.3km west of the Site) on 27 November; and 43 roosting in the same field as the early November record on 31 December. None were recorded in Area 15 in January and February (a March survey was not undertaken in this Area). These birds also used Pegwell Bay.
16	Upland Thanet (west) (adjacent to the west)		1	None recorded in survey visits. Outside the survey visits, one golden plover was seen with 43 Lapwings, feeding in oil seed rape at TR330685 on 1st December 2016.
17	Sarre Marshes (4km west)		0	None recorded.
18	Wantsum Marshes (5km west)		1	One record of a bird feeding in winter cereal on 13 November. Outside the survey visits, a flock of 90 was feeding in winter wheat just north of Chislet (in the south east of Area 18) on 21 January.
19	Minnis Bay Marshes (2.5km north-west)		28	Up to 28 birds were recorded roosting in the fields
20	Reculver (6.5km north-west)		4	Up to four birds were recorded overflying the area on three visits. Outside the survey visits, a flock of 20 was roosting in oilseed rape stubble at TR245690 on 6th March 2017.
21	Swalecliffe (16km north-west)		0	None recorded. Much of this area has been rendered unsuitable since previous survey by the establishment of static caravan parks and a football ground.
22	Long Rock (17km north-west)	12	392	Up to 392 were recorded roosting in the intertidal zone in December-January. Golden plover were noted in this area only in the early morning, after which disturbance by visitors caused the birds to depart.

4.5.5 Results from the surveys in 2002/03 (Griffiths, 2004) and 2016/17 (Henderson & Sutherland, 2017) 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).

4.5.6 KMBRC provided a summary of the 1,073 records of golden plover (within approximately 5km of the Site) they hold, the most recent of which being in 2012 and the closest to the Site, being on the intertidal mudflats of Pegwell Bay. Wetland Bird Survey (WeBS) core count data for Pegwell Bay was purchased from the British Trust for Ornithology (BTO), a summary of which is provided in **Table 4.2**.

Table 4.2 Peak monthly counts of golden plover in Pegwell Bay, from winters 2000/01-2014/15

Winter	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Peak count	Month
2000/01	196	414	41	950	3,160	4,000	1070	1,404	4,000	Feb
2001/02	0	840	2,680	6,000	7,000	2,000	3750	3,711	7,000	Jan
2002/03	0	1,350	2,450	190	5,800	4,710	150	2,441	5,800	Jan
2003/04	62	1,410	6,240	5,500	8,000	1,125	14	3,193	8,000	Jan
2004/05	95	0	3,830	5,200	5,330	4,500	920	3,312	5,330	Jan
2005/06	79	2,070	550	7,000	1,900	2,500	595	2,099	7,000	Dec
2006/07	11	663	3,730	945	2,900	4,170	80	1,785	4,170	Feb
2007/08	25	1,500	4,500	5,500	5,000	4,200	0	3,454	5,500	Dec
2008/09	0	0	2,000	3,500	3,230	3,150	5	2,377	3,500	Dec
2009/10	0	700	1,200	60	753	1,100	410	703	1,200	Nov
2010/11	132	160	3,400	51	2,000	0	0	1,148	3,400	Nov
2011/12	1	1100	1,350	3,000	3,500	0	0	2,237	3,500	Jan
2012/13	1	180	2,000	2,820	4,330	2,820	285	2,072	4,330	Jan
2013/14	16	530	820	1,050	1,093	0	0	701	1,093	Jan
2014/15	1	0	1,147	2,456	0	760	0	1,454	2,456	Dec

Turnstone

4.5.7 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.

4.5.8 The Thanet Coast Turnstone monitoring report (Hodgson, 2016) concluded from six surveys undertaken between 2001 -2010 that the population of turnstone within the SPA varied from 1,087 to 1,335 birds, with a mean of 1,227. A coordinated count in 2013 showed a marked decline, with 620 turnstone counted. Further coordinated counts in winter 2013/14 (two counts) and latterly in 2016 (single count) confirmed this decline, with 583, 664 and 537 birds recorded respectively. It was suggested in Hodgson (2016) that prior to high tide, the turnstones from the Thanet Coast & Sandwich Bay SPA flew to join a roost, 2.5km west of Whitstable Harbour on the north Kent coast, within the Swale SPA and some 18km north-west of the Site. This suggestion was based on results from coastal survey plots. It would therefore appear that the birds, as would be expected for this species, are following the coastline around Thanet and not undertaking any overland movements. Tabulated survey results from the report indicate that turnstone concentrations within the Thanet Coast & Sandwich Bay SPA occur mainly across the northern extremities of the SPA, heading west toward Whitstable, with Pegwell Bay supporting only a small proportion of the numbers mentioned here (see **Table 4.3**).

Little Tern

4.5.9 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

4.5.10 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. **Table 4.3** shows the peak winter counts in Pegwell Bay for the notified feature species of these SSSIs, together with those for turnstone (an SPA designated species). 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.

Table 4.3 Peak winter counts of SSSI species at Pegwell Bay[18]

Species	2010/11	2011/12	2012/13	2013/14	2014/15
Sanderling	93	120	101	120	106
Ringed plover	27	17	52	17	79
Grey plover	387	370	175	481	230
Turnstone	11	13	65	7	16
Golden plover	3,400	3,500	4,330	1,093	2,456

4.5.11 The SSSI is also notified for its breeding bird assemblage associated with lowland open waters and their margins; though none of the species that potentially form this assemblage are likely to utilise the Site or adjacent farmland due to the lack of suitable wetland habitat. Further afield, the Stodmarsh SPA/Ramsar/SSSI is designated for a variety of wetland bird species (see **Table 4.1**), both during and outside the breeding season. Of these, only hen harrier has the potential to occur within/adjacent to the Site.

[18] The figures provided are obtained from WeBS core counts for Pegwell Bay. The winter period is defined as September-March inclusive, covering the months when the species concerned are most likely to be present.

Lapwing

4.5.12 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 (as listed under Section 41 of NERC), and is also a BoCC red-listed species in Eaton *et al*. (2015). Lapwing and golden plover occupy very similar habitats in winter (including farmland), with surveys undertaken primarily for golden plover also capturing utilisation by lapwing. KMBRC provided a summary of the 1,271 records of lapwing they hold, within 5km of the Site, the closest of which is located within the same 10km 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 (Henderson & Sutherland 2017). Data obtained from the KOS website (www.kentos.org.uk/) shows that lapwing occur year-round within Pegwell Bay (1.8km south-east of the Site), with a peak count of 22,000 birds recorded there on the 5 January 2013. No lapwing were recorded within the Site during the winter bird surveys undertaken for the proposed Stone Hill Park development in 2015/16 (WSP, 2016).

Other legally protected bird species

4.5.13 A pair of barn owl (a WCA Schedule 1 species) was found to be roosting in one of the on-site buildings in July 2015 (WSP, 2016).

Bird-strike data

4.5.14 The CAA provided data from Kent International Airport on bird-strike for the period 2007 to 2017[19]. Within this period reports of bird-strike occurred annually between 2009 and 2013 (with the airport closing in 2014). During that five-year period there was a total of 18 reports, 11 of which were confirmed. Eleven species were involved with one report of an unknown species and another with no remains found. The species included three waders (golden plover, dunlin and ringed plover), two gulls (herring and common gulls); a raptor (kestrel), woodpigeon, a corvid (rook) and two passerines (linnet and meadow pipit). The number of birds struck involved singletons on 14 occasions, two birds on two occasions (woodpigeon and ringed plover); no birds on one occasion with a single record when the number was unknown. Of the 18 reports aircraft were damaged on two occasions: once with a strike involving a kestrel and once with a single bird of an unknown species.

Badger

4.5.15 The location of Badger records is provided in the **Confidential Appendix D**. This information should not be made available in the public domain; such records are therefore located within confidential.

Bats

4.5.16 No records of bats were provided from within the Site. Within 5km of the Site, there were 125 records of bats (since 2000), of at least six species: Common pipistrelle; Nathusius' pipistrelle; soprano pipistrelle; brown long-eared bat; Natterer's bat and serotine. **Table 4.4** shows the summarised data received from Kent Bat Group. Further information on the bat records is provided in **Table C2 in Appendix A**.

[19] The CAA were asked if there were any bird-strike data prior to 2007 and they responded (email, dated 21.11.17, from P. Pinheiro, Intelligence Lead) that there was one bird-strike reported in 2003 and noted that bird-strike reporting mechanisms and regulations saw various changes and updates over the years.

Table 4.4 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	2.5km south-west
Common pipistrelle	44	2015	1.0km north-west
Nathusius' pipistrelle	2	2015	2.9km north-east
Soprano pipistrelle	14	2015	2.4km south-west
Pipistrellus Spp.	15	2015	1.5km south-west
Natterer's bat	23	2015	3.4km north-west
Serotine	1	2001	2.2km south-east
***Chiroptera Spp*.**	6	2015	2.0km north-east

4.5.17 The closest record was of three grounded common pipistrelles, 1.0km north-west of the Site, in 2012. The closest roost is located, 2.4km to the south-west of the Site, with a peak count of 668 individual soprano pipistrelles utilising the roost; this count was undertaken in July and included juveniles on the wing. Typically, this roost supports between 250 and 350 fully grown (adult) bats.

4.5.18 A search on MAGIC (accessed 03.07.2017) showed one granted European Protected Species Mitigation Licence (EPSML) within 5km of the Site, and that was for bats. The licence ran from August 2011 until October 2012, and covered the disturbance of a resting (non-breeding) place for soprano, common and Nathusius pipistrelles, and brown long-eared bat.

Stone Hill Park

4.5.19 Results from a partial survey of the buildings on-site in October 2015, for the proposed Stone Hill Park development, revealed bat roosts in four of the nine buildings inspected (WSP, 2016). Hibernation surveys undertaken for the same project in January to March 2016 confirmed one structure on-site as a brown long-eared bat hibernation roost. Bat activity surveys comprising walked manual transects and the deployment of automated detectors were undertaken in September 2015 to determine levels of bat activity at the Site and species of bat using the Site. The surveys recorded five species of bat active over the Site: common pipistrelle, soprano pipistrelle, noctule, serotine and Nathusius' pipistrelle. Overall levels of activity recorded during the September activity surveys were considered to be low (WSP, 2016).

Dormouse

4.5.20 KMBRC data revealed no records of dormouse since 2000 within the 5km radius of the Site.

Water vole and otter

4.5.21 KMBRC data revealed that since 2000 there have been 130 records of water vole within 5km of the Site. The closest of these were at Minster Marshes, 2.8km south of the Site. One dated record of otter exists from 1952, which was 4.9km south of the Site.

Amphibians

4.5.22 KMBRC data provided one record of great crested newt, in 2011 at Monkton Chalk Pit Nature Reserve, 2.9km to the west of the Site. Records of three further native amphibian species were provided (see **Table 4.5**).

Table 4.5 Summary of amphibian records within 5km of the Site

Species	Number of records since 2000	Distance and direction of the closest record to the Site
Common frog	46	2.2km east
Common toad	1	2.0km east
Smooth newt	8	1.7km south

4.5.23 A search on MAGIC (accessed 03.07.2017) showed that there were no granted EPSML for great crested newt within 10km of the site.

Stone Hill Park

4.5.24 As part of collecting baseline ecological data for the proposed Stone Hill development, the area within the Site and 500m of its boundary was assessed for its potential to support great crested newt (GCN). Potentially suitable terrestrial habitat was present on-site, and a total of four potentially suitable water bodies were identified (both on-site, and off-site within 500m of its boundary). These waterbodies were then subject to Habitat Suitability Index (HSI) assessments along with environmental DNA (eDNA) testing if assessed as suitable (undertaken in 2015). Two of the water bodies were assessed as unsuitable to support GCN and were therefore ruled out of further survey. The remaining two water bodies were assessed as potentially suitable for GCN and samples for eDNA testing were taken, and a single presence/likely absence survey was also undertaken using good practice guidelines (egg searching, bottle trapping and torching). The presence/likely absence survey recorded no GCN, and subsequent eDNA testing confirmed the absence of GCN from both water bodies. It was concluded that as GCN had been confirmed as absent from the surrounding water bodies, this species was unlikely to be using potentially suitable terrestrial habitat on the Site (WSP, 2016).

Reptiles

4.5.25 KMBRC provided records of three species of reptile within 5km of the Site, a summary of which is shown in **Table 4.6**.

Table 4.6 Summary of reptile records within 5km of the Site

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

Key: WCA = Wildlife & Countryside Act 1981 (as amended); SPI = species of principal importance for conservation in England as listed on Section 41 of the NERC Act 2006.

Other mammals

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

Invertebrates

4.5.27 KMBRC provided records of 137 species of invertebrates within 5km of the Site, since 2000. Of these, are 10 priority species (listed on Section 41 of NERC) including three butterflies (wall brown, small heath and small blue), a robber-fly, wasp and bee, and four moths. In addition, 16 species are classified as Notable[20], 13 species as Notable A[21], 55 species as Notable B[22] and 53 are classified as IUCN Red-listed[23]. The IUCN Red-listed species recorded here, are mainly those associated with saltmarsh and sand dune habitats, and are therefore likely to be confined to areas outside the Site. However, there is the potential for some species to occur on-site, including the wall brown and small heath butterflies. A summary of the invertebrate records provided is shown in **Table C3 in Appendix C**.

Vascular plants

4.5.28 **Table 4.7** provides a summary of the KMBRC records of protected or otherwise notable vascular plant species found within 5km of the Site.

Table 4.7 Vascular plants recorded within 5km of the Site since 2000

Species	Legal status / designation	Number of records since 2000	Distance and direction of nearest record to the Site
Basil Thyme	SPI	5	2.6km west
Bedstraw Broomrape	WCA8	1	4.5km south
Cornflour	SPI	4	1.85km south-east
Deptford Pink	SPI	3	4.5km south
Divided Sedge	SPI	20	1.5km south-west
Man Orchid	SPI	2	2.7km west
Martin's Ramping-fumitory	WCA8	3	0.1km west
Prickly Saltwort	SPI	9	1.8km south-east
Sea Barley	SPI	1	3.3km east
Tubular water-dropwort	SPI	12	1.5km south-west

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

[20] Notable - Species which are estimated to occur within the range of 16 to 100 10km squares. (Subdivision into Notable A and Notable B is not always possible because there may be insufficient information available). Superseded by Nationally Scarce, and therefore no longer in use.
[21] Notable A - Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and thought to occur in 30 or fewer 10 km squares of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties. Superseded by Nationally Scarce, and therefore no longer in use.
[22] Notable B -Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10 km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties. Superseded by Nationally Scarce, and therefore no longer in use.
[23] IUCN Red-listing - The IUCN Red List Index (RLI) measures overall trends in extinction risk for groups of species based on genuine changes in their Red List status over time. Habitat availability, population and subpopulation size, number of mature individuals and extent of occurrence are all quantified during the designation of red-list species.

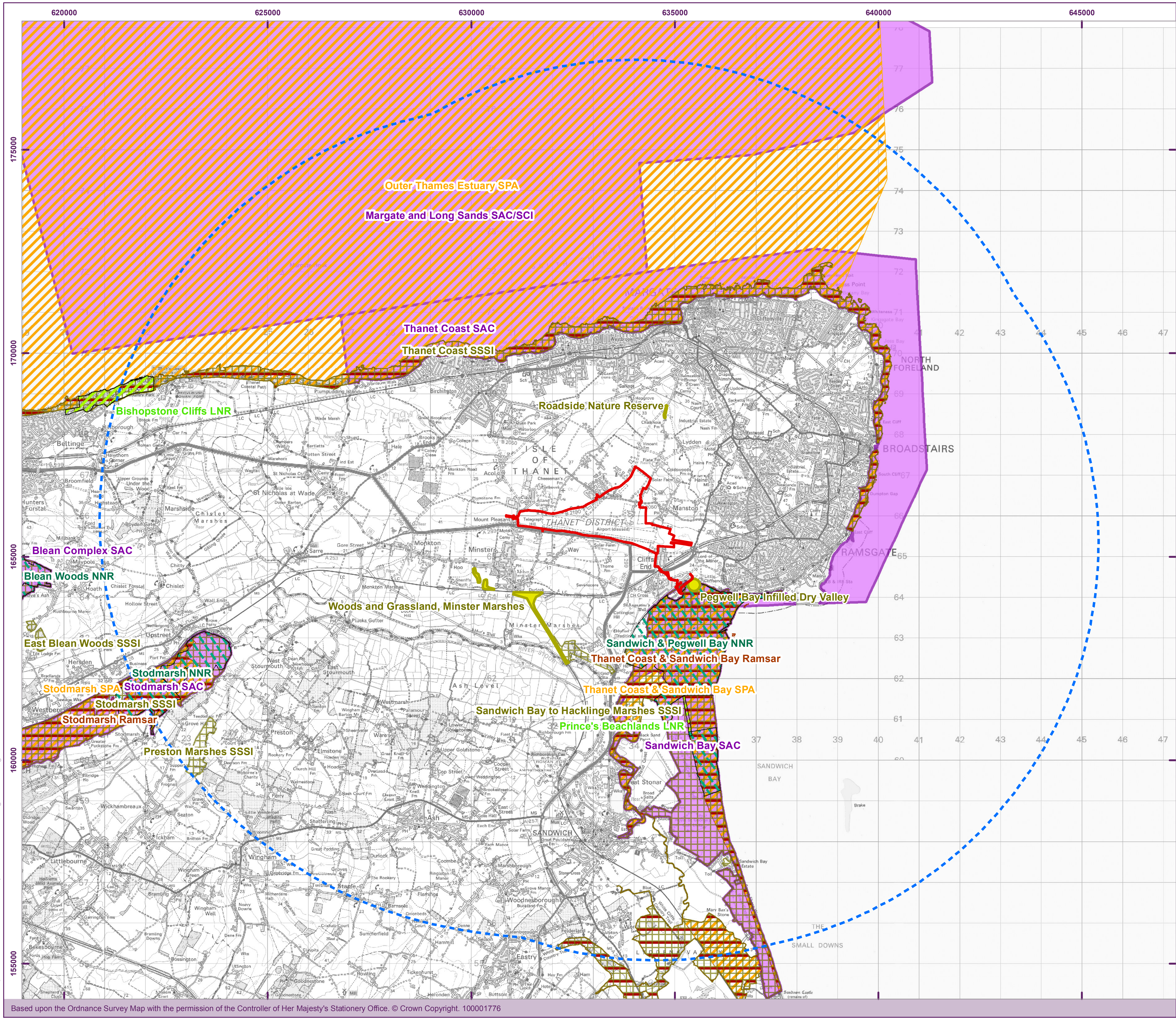
Controlled species

KMBRC provided records of 14 legally controlled species (included under Schedule 9 of the Wildlife and Countryside Act 1981, as amended) recorded within 5km of the Site since 2000; all of which were outside the Site boundary (see **Table 4.8**).

Table 4.8 Legally controlled species found within 5km of the Site

Species	Most recent record	NGR	Record location
Nuttall's Waterweed	2014	TR2863	Various
Japanese Knotweed	2015	TR3665	Pegwell
Yellow Archangel	2002	TR3764	Ramsgate
Wall Cotoneaster	2015	TR3470	Various
Himalayan Cotoneaster	2015	TR3665	Pegwell North
Japanese Rose	2015	TR3463	Various
New Zealand Pigmyweed	2014	TR3160	Various
Water Fern	2004	TR3763	Various
Three-cornered Garlic	2013	TR3870	Cliftonville
Wireweed	2013	TR3966	Various
Wakame	2013	TR3567	Various
Chinese Mitten Crab	2006	TR3564	Pegwell bay
American Slipper Limpet	2014	TR3965	Various
American Mink	2014	TR3663	Various

National Grid Reference (NGR) of the Site: TR3365



Key

- Order Limits
- 10km study area
- SPA
- Local Nature Reserve
- Ramsar
- National Nature Reserve
- SSSI
- SAC
- Local Wildlife Sites

0 1 2 3 4 5 km

Scale at A3: 1:90,000

Client

RSP

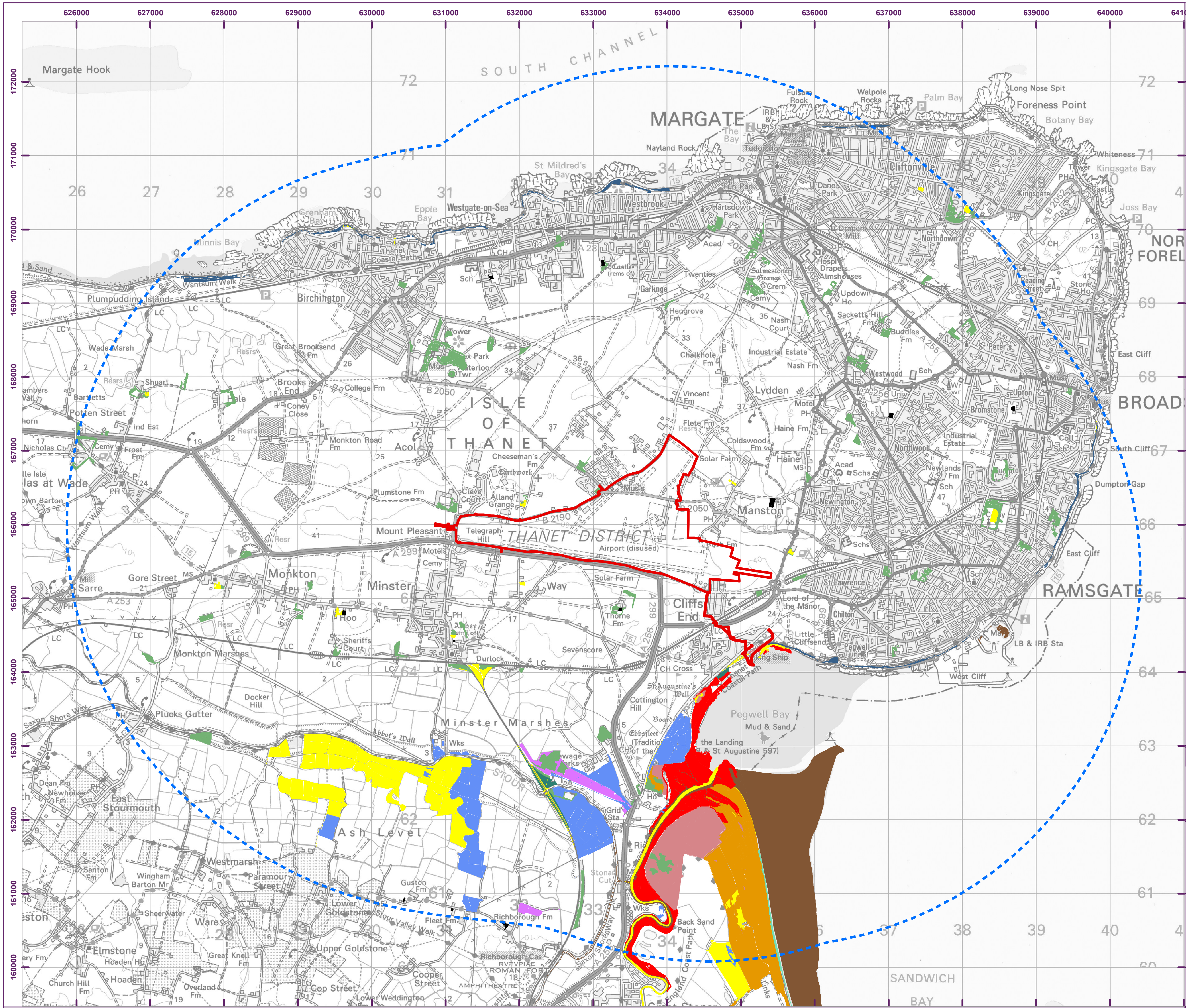
Manston Airport DCO
Environmental Statement
Ecological Desk Study
Report

amec foster wheeler

Figure 4.1
Designated sites of nature conservation interest

March 2018 38199-Lon445.mxd parkj

file: H:\Projects\38199 LON Manston Airport DCO EIA\Drawings\ArcGIS\Figures\38199-Lon445.mxd



Priority Habitat

RSP

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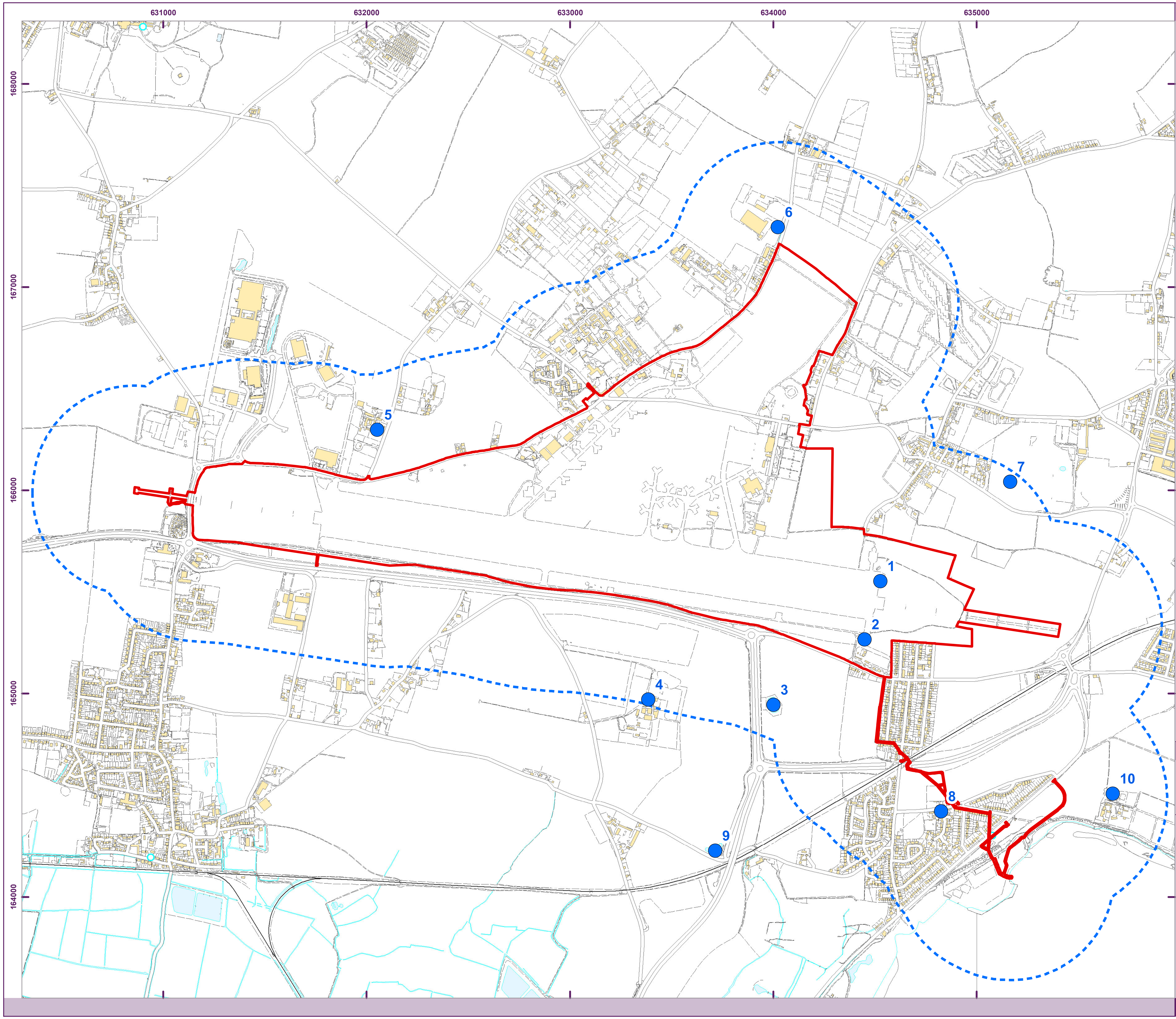
Figure 4.2
Priority Habitats within 5km of the Site

March 2018



RSP

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Figure 4.3
Waterbodies within 500m of the Site

March 2018

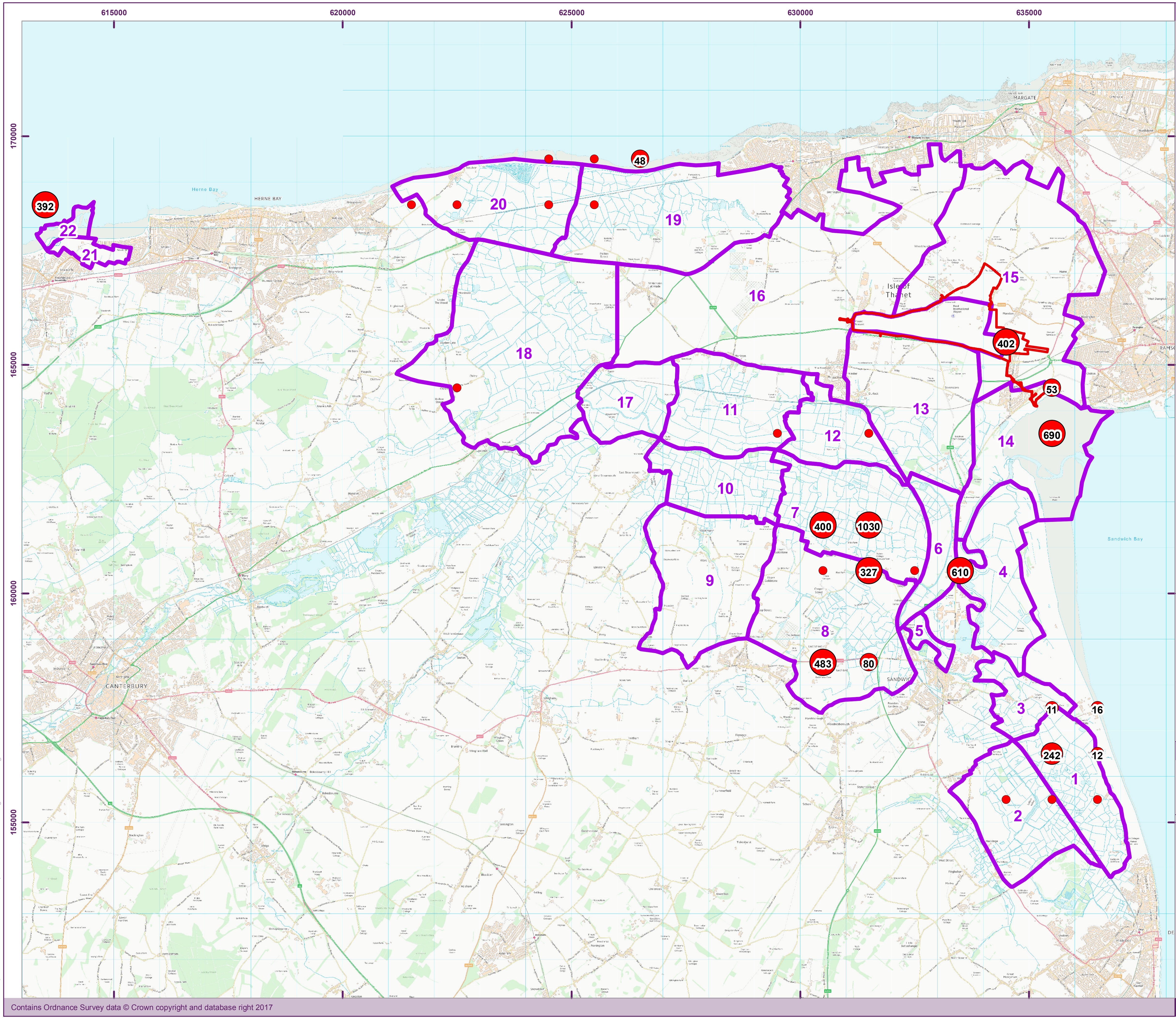

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Figure 4.4
Peak counts of golden plover in winter 2016/17, from (Henderson & Sutherland, 2017)

March 2018

38199-Lon448.mxd parkj

5. Summary

5.1 Designated Sites

5.1.1 No sites with statutory designation for biodiversity conservation lie within the Site boundary. Seventeen statutory designated sites are located within 10km of the Site. Of these, nine are of international importance, including the Thanet Coast and Sandwich Bay SPA/Ramsar site, Sandwich Bay SAC and Thanet Coast Marine SAC, all of which are at their closest, 925m east of the Site. The constituent SSSIs of the SPA include the Thanet Coast SSSI and Sandwich Bay to Hacklinge Marshes SSSI, the latter also being located 925 east of the Site. These sites are designated for a variety of biodiversity including for 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.

5.2 Habitats of Principal Importance (HPI)

5.2.1 Nine HPI have been identified within 2km of the Site, none of which occur within the Site. These habitats consist of wood pasture & parkland; deciduous woodland; lowland fens; reedbeds; coastal & floodplain grazing marsh; coastal saltmarsh; mudflats; and maritime cliffs & slopes. Numerous isolated and scattered parcels of woodland occur within 2km of the Site, and the remaining coastal and wetland HPI occur to the south and south-east of the Site around Pegwell Bay.

5.3 Protected and Notable Species

5.3.1 The desk study identified a number of legally protected and otherwise notable species within 5km of the Site (though none within the Site). Many of the species identified are highly specialist, occupying unique and rare niches found only in habitats that do not occur within the Site. However, the desk study revealed records for other species which might utilise the Site and adjacent area, as follows:

- Birds: records of protected and otherwise notable species that could potentially utilise the Site / adjacent area for foraging, roosting or breeding, including: golden plover (an SPA species), WCA Schedule 1 species (hobby, quail, barn owl and kingfisher) and a wide range of priority species associated with farmland (such as skylark, corn bunting and yellowhammer) as well as woodland and scrub habitats.
- Bats: records of at least six species, which might utilise the Site for foraging or roosting. Four summer and one hibernation bat roosts were identified in a total of five buildings on-site in 2015 and 2016 (WSP, 2016).
- Amphibians: one record of great crested newt (GCN within 5km of the Site. In addition, the desk study revealed six water bodies within 500m of the Site (which could potentially support breeding GCN), one of which was within the Site. As a result of assessment and survey, WSP (2016) concluded that GCN were unlikely to occur on-site.
- Reptiles: the desk study revealed records of viviparous lizard, grass snake and slow worm within 5km of the Site, all of which could potentially occur within the Site.
- Other mammals: records of three other priority mammal species: hedgehog, brown hare and harvest mouse, all of which could potentially occur on-site.
- Invertebrates: records for a large number of species, including ten priority species, though many are likely to be associated with coastal habitats that do not occur on-site.
- Plants: records of protected and priority species, some of which could also potentially occur within the Site.

- Invasive species: records of 14 legally controlled species were received for within 5km of the Site, all of which were out with the Site, though could potentially occur on-site.

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Appendix A
Scientific Names of Species Referred to in this Report

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*
Otter	*Lutra lutra*
Harvest mouse	*Micromys minutus*
Hedgehog	*Erinaceus europaeus*
Nathusius' pipistrelle	*Pipistrellus nathusii*
Natterer's bat	*Myotis nattereri*
Pipistrelle/Pipistrellus species	*Pipistrellus species*
Serotine bat	*Eptesicus serotinus*
Soprano pipistrelle	*Pipistrellus pygmaeus*
Water vole	*Arvicola amphibious*
Birds	
Red-throated diver	*Gavia stellata*
Black-throated diver	*Gavia arctica*
Great northern diver	*Gavia immer*
Great crested grebe	*Podiceps cristatus*
Slavonian grebe	*Podiceps auritus*
Black-necked grebe	*Podiceps nigricollis*
Balearic shearwater	*Puffinus mauretanicus*
Storm petrel	*Hydrobates spp*
Leach's petrel	*Oceanodroma leucorhoa*
Bittern	*Botaurus stellaris*
Little egret	*Egretta garzetta*
Purple heron	*Ardea purpurea*
Black stork	*Ciconia nigra*
White stork	*Ciconia ciconia*

Common/ English name	Scientific name
Glossy ibis	*Plegadis falcinellus*
Spoonbill	*Platalea leucorodia*
Bewick's swan	*Cygnus columbianus*
Whooper swan	*Cygnus cygnus*
White-fronted goose	*Anser albifrons*
Barnacle goose	*Branta leucopsis*
Brent goose	*Branta bernicla*
Shelduck	*Tadorna tadorna*
Wigeon	*Anas penelope*
Gadwall	*Anas strepera*
Teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Pintail	*Anas acuta*
Garganey	*Anas querquedula*
Shoveler	*Anas clypeata*
Pochard	*Aythya ferina*
Tufted duck	*Aythya fuligula*
Scaup	*Aythya marila*
Long-tailed duck	*Clangula hyemalis*
Common scoter	*Melanitta nigra*
Velvet scoter	*Melanitta fusca*
Goldeneye	*Bucephala clangula*
Smew	*Mergus albellus*
Honey buzzard	*Pernis apivorus*
Black kite	*Milvus migrans*
Red kite	*Milvus milvus*
Marsh harrier	*Circus aeruginosus*
Hen harrier	*Circus cyaneus*
Montagu's harrier	*Circus pygargus*
Goshawk	*Accipiter gentilis*
Osprey	*Pandion haliaetus*
Merlin	*Falco columbarius*

Common/ English name	Scientific name
Hobby	*Falco subbuteo*
Peregrine	*Falco peregrinus*
Grey partridge	*Perdix perdix*
Quail	*Coturnix coturnix*
Corncrake	*Crex crex*
Crane	*Grus grus*
Avocet	*Recurvirostra avosetta*
Little ringed plover	*Charadrius dubius*
Ringed plover	*Charadrius hiaticula*
Kentish plover	*Charadrius alexandrinus*
Dotterel	*Charadrius morinellus*
Golden plover	*Pluvialis apricaria*
Grey plover	*Pluvialis squatarola*
Lapwing	*Vanellus vanellus*
Sanderling	*Calidris alba*
Temminck's stint	*Calidris temminckii*
Purple sandpiper	*Calidris maritima*
Ruff	*Philomachus pugnax*
Snipe	*Gallinago gallinago*
Woodcock	*Scolopax rusticola*
Black-tailed godwit	*Limosa limosa*
Bar-tailed godwit	*Limosa lapponica*
Whimbrel	*Numenius phaeopus*
Curlew	*Numenius arquata*
Greenshank	*Tringa nebularia*
Green sandpiper	*Tringa ochropus*
Wood sandpiper	*Tringa glareola*
Turnstone	*Arenaria interpres*
Arctic skua	*Stercorarius parasiticus*
Mediterranean gull	*Larus melanocephalus*
Little gull	*Larus minutus*
Herring gull	*Larus argentatus*

Common/ English name	Scientific name
Kittiwake	*Rissa tridactyla*
Sandwich tern	*Sterna sandvicensis*
Roseate tern	*Sterna dougallii*
Common tern	*Sterna hirundo*
Arctic tern	*Sterna paradisaea*
Little tern	*Sterna albifrons*
Black tern	*Chlidonias niger*
Puffin	*Fratercula arctica*
Turtle dove	*Streptopelia turtur*
Cuckoo	*Cuculus canorus*
Barn owl	*Tyto alba*
Short-eared owl	*Asio flammeus*
Nightjar	*Caprimulgus europaeus*
Kingfisher	*Alcedo atthis*
Bee-eater	*Merops apiaster*
Hoopoe	*Upapa epops*
Wryneck	*Jynx torquilla*
Lesser spotted woodpecker	*Dendrocopus minor*
Short-toed lark	*Calandrella brachydactyla*
Woodlark	*Lullula arborea*
Skylark	*Alauda arvensis*
Sand martin	*Riparia riparia*
Tawny pipit	*Anthus campestris*
Tree pipit	*Anthus trivialis*
Meadow pipit	*Anthus pratensis*
Yellow wagtail	*Motacilla flava*
Grey wagtail	*Motacilla cinerea*
Dunnock	*Prunella modularis*
Nightingale	*Luscinia megarhynchos*
Bluethroat	*Luscinia svecica*
Whinchat	*Saxicola rubetra*
Ring ouzel	*Turdus torquatus*

Common/ English name	Scientific name
Fieldfare	*Turdus pilaris*
Song thrush	*Turdus philomelos*
Redwing	*Turdus iliacus*
Mistle thrush	*Turdus viscivorus*
Cetti's warbler	*Cettia cetti*
Grasshopper warbler	*Locustella naevia*
Aquatic warbler	*Acrocephalus paludicola*
Dartford warbler	*Sylvia undata*
Barred warbler	*Sylvia nisoria*
Wood warbler	*Phylloscopus sibilatrix*
Firecrest	*Regulus ignicapillus*
Spotted flycatcher	*Muscicapa striata*
Red-breasted flycatcher	*Ficedula parva*
Pied flycatcher	*Ficedula hypoleuca*
Bearded tit	*Panurus biarmicus*
Willow tit	*Parus montanus*
Golden oriole	*Oriolus oriolus*
Red-backed shrike	*Lanius collurio*
Starling	*Sturnus vulgaris*
House sparrow	*Passer domesticus*
Tree sparrow	*Passer montanus*
Brambling	*Fringilla montifringilla*
Serin	*Serinus serinus*
Linnet	*Carduelis cannabina*
Twite	*Carduelis flavirostris*
Common crossbill	*Loxia curvirostra*
Parrot crossbill	*Loxia pytyopsittacus*
Bullfinch	*Pyrrhula pyrrhula*
Hawfinch	*Coccothraustes coccothraustes*
Lapland bunting	*Calcarius lapponicus*
Snow bunting	*Plectrophenax nivalis*
Yellowhammer	*Emberiza citrinella*

Common/ English name	Scientific name
Ortolan bunting	*Emberiza hortulana*
Reed bunting	*Emberiza schoeniclus*
Corn bunting	*Miliaria calandra*
Herpetofauna	
Common frog	*Rana temporaria*
Common toad	*Bufo bufo*
Smooth newt	*Lissotriton vulgaris*
Grass snake	*Natrix natrix*
Slow-worm	*Anguis fragilis*
Viviparous lizard	*Zootoca vivipara*
Flora	
Basil Thyme	*Clinopodium acinos*
Bedstraw Broomrape	*Orobanche caryophyllacea*
Cornflour	*Centaurea cyanus*
Deptford Pink	*Dianthus armeria*
Divided Sedge	*Carex divisa*
Man Orchid	*Orchis anthropophora*
Martin's Ramping-fumitory	*Fumaria reuteri*
Prickly Saltwort	*Kali turgidum*
Sea Barley	*Hordeum marinum*
Sharp-leaved pondweed	*Potamogeton acutifolius*
Invasive species	
Nuttall's Waterweed	*Elodea nuttallii*
Japanese Knotweed	*Fallopia japonica*
Yellow Archangel	*Lamoastrum galeobdolon argentatum*
Wall Cotoneaster	*Cotoneaster horizontalis*
Himalayan Cotoneaster	*Cotoneaster simonsii*

Common/ English name	Scientific name
Japanese Rose	*Rosa rugosa*
New Zealand Pigmyweed	*Crassula helmsii*
Water Fern	*Azolla filiculoides*
Three-cornered Garlic	*Allium triquetrum*
Wireweed	*Sargassum muticum*
Wakame	*Undaria pinnatifida*
Chinese Mitten Crab	*Eriocheir sinensis*
American Slipper Limpet	*Crepidula fornicata*
American Mink	*Neovison vison*
Other Invertebrates	
White-clawed Crawfish	*Austropotamobius pallipes*

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 2017*. 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[24], 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 2017*. 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.

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 2017*. 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:

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

- 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[25] 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.

Otter

The otter 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 2017*. 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.

Water vole

The water vole is listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and is afforded limited protection under Section 9 of this Act. This makes it an offence, *inter alia*, to:

[25] 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 2017* 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.

- intentionally kill, injure, or take (handle) a water vole;
- intentionally or recklessly disturb water voles while they are using such a structure or place; or
- intentionally or recklessly damage or destroy or obstruct access to any structure or place which water voles use for shelter or protection.

White-clawed crayfish

The white-clawed crayfish is listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and is afforded limited protection under Section 9 of this Act. This makes it an offence, *inter alia*, to:

- intentionally take individuals of this species.

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*);
- 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

Table C1 Protected and other notable bird species within 5km 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	SPI; 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; SPI	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; SPI; WCA1	33	2012	1.85
Whooper swan	Annex 1; WCA1	40	2012	0.50
White-fronted goose	SPI; BoCC (Red)	131	2012	1.86
Barnacle goose	Annex 1	25	2012	1.85
Brent goose	SPI	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; SPI; BoCC (Red)	28	2009	1.85
Long-tailed duck	WCA1; BoCC (Red)	32	2008	1.75
Common scoter	WCA1; SPI; BoCC (Red)	371	2012	1.85
Velvet scoter	WCA1; BoCC (Red)	29	2012	1.85
Goldeneye	WCA1	49	2012	1.75
Smew	Annex 1	8	2012	3.80
Honey buzzard	Annex 1; WCA1	93	2012	1.75

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
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; SPI; 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	SPI; BoCC (Red)	369	2012	0.50
Quail	WCA1	88	2012	1.85
Corncrake	Annex 1; WCA1; SPI; 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	SPI; 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; SPI; BoCC (Red)	505	2012	1.85
Bar-tailed godwit	Annex 1	1071	2012	1.85
Whimbrel	WCA1; BoCC (Red)	729	2013	1.85
Curlew	SPI; BoCC (Red)	1066	2012	1.86
Greenshank	WCA1	747	2012	1.75

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
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	SPI; 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; SPI; 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	SPI; BoCC (Red)	386	2012	0.50
Cuckoo	SPI; 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; SPI; 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	SPI; BoCC (Red)	86	2005	1.75
Short-toed lark	Annex 1	7	2011	1.85
Woodlark	Annex 1; WCA1; SPI	74	2012	4.83
Skylark	SPI; BoCC (Red)	621	2012	0.50
Shorelark	WCA1	64	2012	1.85
Tawny pipit	Annex 1	34	2012	1.85
Tree pipit	SPI; BoCC (Red)	140	2012	1.85

Species	Legal status	No. of records since 2000	Year of most recent record	Distance from site (km)
Yellow wagtail	SPI; BoCC (Red)	534	2012	0.50
Grey wagtail	BoCC (Red)	367	2012	1.85
Dunnock	SPI	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	SPI; BoCC (Red)	295	2012	4.83
Fieldfare	WCA1; BoCC (Red)	456	2012	1.86
Song thrush	SPI; 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	SPI; BoCC (Red)	58	2012	1.80
Aquatic warbler	Annex 1; SPI; 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	SPI; BoCC (Red)	33	2012	1.75
Firecrest	WCA1	564	2012	1.85
Spotted flycatcher	SPI; 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	SPI; 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	SPI; BoCC (Red)	637	2013	0.50
House sparrow	SPI; BoCC (Red)	386	2012	0.50
Tree sparrow	SPI; BoCC (Red)	239	2012	0.50
Brambling	WCA1	386	2012	1.86
Serin	WCA1	49	2012	1.85
Linnet	SPI; BoCC (Red)	718	2012	0.50
Twite	SPI; BoCC (Red)	171	2012	1.85

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

Table C2 A summary of bat records received from Kent Bat Group within 5km search radius of the Site

Species	Foraging	Roosting	Hibernation	Grounded	Droppings
Brown long-eared	1		18		1
Common pipistrelle	34	2	3	5	
Nathusius' pipistrelle	2				
Soprano pipistrelle	7	7			
Pipistrellus Sp.	13	2			
Natterer's			23		
Serotine	1				
Chiroptera Sp.		2	4		

Table C3 Summary of the invertebrate records provided by KMBRC

Vernicular name	Scientific name	Notable	Notable A21	Notable B	Red-listed	Records since 2000	Most recent record
Variable damselfly	*Coenagrion pulchellum*				✔	1	2006
Asiraca clavicornis	*Asiraca clavicornis*			✔		2	2010
Dune tiger beetle	*Cicindela martima*			✔		4	2012
Bembidion (Notaphemphanes) ephippium	*Bembidion (Notaphemphanes) ephippium*	✔				2	2004
Pogonus littoralis	*Pogonus littoralis*			✔		1	2002
Amara (Amara) curta	*Amara (Amara) curta*			✔		2	2012
Amara (Amara) spreta	*Amara (Amara) spreta*			✔		1	2002
Ophonus (Ophonus) ardosiacus	*Ophonus (Ophonus) ardosiacus*			✔		1	2005
Saltmarsh short-spur	*Anisodactylus poeciloide*				✔	1	2001
Dicheirotrichus obsoletus	*Dicheirotrichus obsoletus*			✔		1	2012
Lucinus depressus	*Lucinus depressus*			✔		1	2012
Demetrias (Demetrias) monostigma	*Demetrias (Demetrias) monostigma*			✔		2	2002
Isochnus sequensi	*Isochnus sequensi*				✔	4	2002
Microplontus campestris	*Microplontus campestris*			✔		2	2002
Pselactus spadix	*Pselactus spadix*			✔		2	2002
Tanymecus palliatus	*Tanymecus palliatus*			✔		2	2002
Hypera (Hypera) fuscocinerea	*Hypera (Hypera) fuscocinerea*			✔		1	2002
Haliplus (Liaphlus) variegatus	*Haliplus (Liaphlus) variegatus*				✔	1	2012
Oxypoda lurida	*Oxypoda lurida*	✔				1	2002
Aleochara (coprochara) verna	*Aleochara (coprochara) verna*				✔	2	2004
Gabrius psseticus	*Gabrius psseticus*			✔		2	2002
Hypocaccus (hypocaccus) metallicus	*Hypocaccus (hypocaccus) metallicus*				✔	2	2004
Nicrophorus interruptus	*Nicrophorus interruptus*			✔		1	2007
Stag beetle	*Lucanus cervus*			✔		2	2006

Vernicular name	Scientific name	Not able	Notabl e A21	Nota ble B	Red-listed	Records since 2000	Most recent record
Athous (Orthathous) campyloides	*Athous (Orthathous) campyloides*			✔		1	2002
Adrastus rachifer	*Adrastus rachifer*				✔	2	2002
Rhagonycha lutea	*Rhagonycha lutea*			✔		1	2002
Hedobia (Ptinomorphus) imperialis	*Hedobia (Ptinomorphus) imperialis*			✔		1	2002
Meligethes fulvipes	*Meligethes fulvipes*	✔				2	2002
Meligethes rotundicollis	*Meligethes rotundicollis*	✔				3	2002
Atomaria (Anchicera) scutellaris	*Atomaria (Anchicera) scutellaris*				✔	1	2002
Adonis' ladybird	*Hippodamia (Adonia) variegata*			✔		2	2001
Mordellistena (Mordellina) acuticollis	*Mordellistena (Mordellina) acuticollis*				✔	1	2002
Crypticus quisquilius	*Crypticus quisquilius*			✔		2	2003
Black-headed cardinal beetle	*Pyrochroa coccinea*			✔		1	2006
Lissodema denticolle	*Lissodema denticolle*			✔		1	2002
Cabbage flea beetle	*Phyllotreta cruciferae*			✔		1	2002
Flax flea beetle	*Longitarsus parvulus*		✔			2	2012
Longitarsus pratensis	*Longitarsus pratensis*				✔	2	2002
Mallow flea beetle	*Podagrica fuscicornis*			✔		3	2004
Mallow flea beetle	*Podagrica fuscipes*		✔			1	2005
Kalcapion semivittatum	*Kalcapion semivittatum*		✔			1	2002
Five-spot ermel	*Ethmia terminella*				✔	1	2011
Dotted ermel	*Ethmia dodecea*			✔		7	2006
Comfrey ermel	*Ethmia quadrillella*		✔			2	2011
Bordered ermel	*Ethmia bipunctella*				✔	21	2015
Alder signal	*Stathmopoda pedella*			✔		4	2011
Painted neb	*Eulamprotes wilkella*			✔		25	2011

Vernicular name	Scientific name	Not able	Notabl e A21	Nota ble B	Red-listed	Records since 2000	Most recent record
Wainscot neb	*Monochroa palustrellus*			✔		9	2010
Mallow groundling	*Platyedra subcinerea*	✔				62	2011
Hollyhock seed moth	*Pexicopia malvella*			✔		92	2011
Fen crest	*Brachmia inornatella*			✔		5	2011
Seathorn groundling	*Gelechia hippophaella*				✔	1	2006
Beet moth	*Scrobipalpa ocellatella*	✔				38	2011
Coast groundling	*Caryocolum vicinella*			✔		1	2003
Narrow groundling	*Caryocolum alsinella*	✔				1	2007
Meadow groundling	*Caryocolum proxima*				✔	1	2004
Straw obscure	*Oegoconia caradjai*			✔		5	2011
Rest harrow	*Aplasta ononaria*				✔	38	2011
Bright wave	*Idaea ochrata*				✔	96	2011
Sub-angled wave	*Scopula nigropunctata*				✔	6	2011
Tawny wave	*Scopula rubiginata*				✔	2	2009
Kent bent-wing	*Phyllocnistis xenia*				✔	16	2011
Ground lackey	*Malacosoma castrensis*				✔	22	2011
Scarce chocolate-tip	*Clostera anachoreta*				✔	15	2011
Silver barred	*Deltote bankiana*				✔	6	2011
White spot	*Hadena albimacula*				✔	1	2007
Small ranunculus	*Hecatera dysodea*				✔	72	2011
Toadflax brocade	*Calophasia lunula*				✔	65	2015
Concolorous	*Photedes extrema*				✔	2	2011
Flame brocade	*Trigonophora flammea*				✔	1	2003
Dotted footman	*Pelosia muscerda*				✔	5	2011
Pigmy footman	*Eilema pygmaeola*				✔	26	2011

Vernicular name	Scientific name	Notable	Notable A21	Notable B	Red-listed	Records since 2000	Most recent record
Olive cresent	*Trisateles emortualis*				✔	1	2001
Dark crimson underwing	*Catocala sponsa*				✔	2	2006
Scarce black arches	*Nola aerugula*				✔	2	2011
Swallowtail	*Papilio machaon*				✔	1	2003
Small blue	*Cupido minimus*				✔	1	2008
Small heath	*Coenonympha pamphilus*				✔	61	2015
Wall Brown	*Lasiommata megera*				✔	14	2012
Bulrush veneer	*Calamotropha paludella*			✔		32	2011
Powdered grass-veneer	*Thisanotia chrysonuchella*			✔		2	2010
Waste grass-veneer	*Pediasia contaminella*			✔		37	2011
Salt-marsh grass-veneer	*Pediasia aridella*			✔		29	2011
Hook-tipped grass-veneer	*Platytes alpinella*				✔	37	2011
Marbled yellow pearl	*Evergestis extimalis*			✔		246	2011
Giant water veneer	*Schoenobius gigantella*			✔		59	2011
Diamond-spot sable	*Loxostege sticticalis*				✔	1	2002
Sulphur pearl	*Sitochroa palealis*	✔				10	2011
Golden pearl	*Anania verbascalis*			✔		1	2001
Twin-spot honey	*Aphomia zelleri*				✔	35	2011
Kent knot-horn	*Moitrelia obductella*				✔	13	2011
Rosy-striped knot-horn	*Oncocera semirubella*			✔		66	2011
Gorse knot-horn	*Pempelia genistella*		✔			19	2011
Silver-edged knot-horn	*Pima boisduvaliella*				✔	3	2011
Hoary knot-horn	*Gymnancyla canella*		✔			31	2011
Spindle knot-horn	*Nephopterix angustella*			✔		58	2011
Saltmarsh knot-horn	*Ancylosis oblitella*	✔				9	2011

Vernicular name	Scientific name	Notable	Notable A21	Notable B	Red-listed	Records since 2000	Most recent record
Agate knot-horn	*Nyctegretis lineana*				✔	15	2011
Wormwood knot-horn	*Euzophera cinerosella*			✔		46	2011
Long-legged tabby	*Synaphe punctalis*			✔		64	2011
Flecked general	*Stratiomys singularior*	✔				2	2008
Dotted bee-fly	*Bombylius discolor*	✔				3	2010
Crochet-hooked stiletto	*Thereva plebeja*	✔				1	2003
Hornet robberfly	*Asilus crabroniformis*	✔				1	2000
Volucella inanis	*Volucella inanis*	✔				1	2008
Volucella zonaria	*Volucella zonaria*	✔				1	2011
Melieria picta	*Melieria picta*	✔				1	2009
Myopites eximius	*Myopites eximius*				✔	2	2008
Myopites inulaedyssentericae	*Myopites inulaedyssentericae*				✔	1	2002
Hydrotaea parva	*Hydrotaea parva*	✔				1	2002
Hedychrum niemelai	*Hedychrum niemelai*				✔	5	2009
Small velvet ant	*Smicromyrme rufipes*			✔		4	2013
Spider-hunting wasp	*Evagetes pectinipes*				✔	4	2013
Brown-headed mason wasp	*Odynerus (Odynerus) melancephalus*		✔			3	2008
Mud wasp	*Podalonia affinis*				✔	5	2013
Lestiphorus bicinctus	*Lestiphorus bicinctus*			✔		1	2002
Four-banded weevil-wasp	*Cerceris quadricincta*				✔	13	2014
Bee wolf	*Philanthus triangulum*				✔	9	2013
Sea-aster colletes bee	*Colletes (colletes) halophilus*		✔			1	2005
Margined colletes	*Colletes (colletes) marginatus*		✔			1	2001
Trimmer's mining bee	*Andrena (hoplandrena) trimmerana*			✔		1	2008

Vernicular name	Scientific name	Not able	Notabl e A21	Nota ble B	Red-listed	Records since 2000	Most recent record
Andrena (Cnemidandrena) nigriceps	*Andrena (Cnemidandrena) nigriceps*			✔		1	2007
Andrena (Plastandrena) pilipes	*Andrena (Plastandrena) pilipes*			✔		8	2010
Andrena (Micradrena) alfkenella	*Andrena (Micradrena) alfkenella*				✔	1	2004
Andrena (Micradrena) minutuloides	*Andrena (Micradrena) minutuloides*		✔			4	2009
Lasioglossum (Evylaeus) malachurum	*Lasioglossum (Evylaeus) malachurum*			✔		2	2007
Lasioglossum (Evylaeus) pauxillum	*Lasioglossum (Evylaeus) pauxillum*		✔			2	2008
Hairy-legged mining bee	*Dasypoda hirtipes*			✔		1	2007
Silvery leaf-cutter bee	*Megachile (Eutricharaea) leachella*			✔		5	2009
Coelioxys (Coelioxys) mandibularis	*Coelioxys (Coelioxys) mandibularis*				✔	2	2006
Nomada flavopicta	*Nomada flavopicta*			✔		1	2009
Nomada fucata	*Nomada fucata*		✔			7	2009
6-Banded nomad bee	*Nomada fulvicornis*				✔	3	2009
Anthophora (Dasymegilla) quadrimaculata	*Anthophora (Dasymegilla) quadrimaculata*		✔			3	2007
Bombus (Thoracobombus) sylvarum subsp.distinctus	*Bombus (Thoracobombus) sylvarum subsp.distinctus*	✔				1	2010
The shining ram's-horn	*Segmentina nitida*				✔	20	2012

NB: those entries in **bold** are priority species, listed on Section 41 of NERC 2006

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